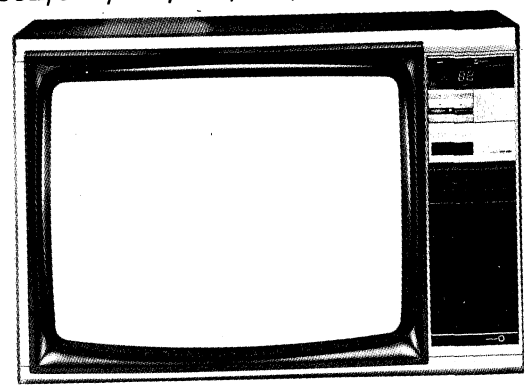
Colour television 26CT6470

50Z/51Z/56R/57R/57Z/65Z/67Z/73Z/80Z

Service
Service
Service



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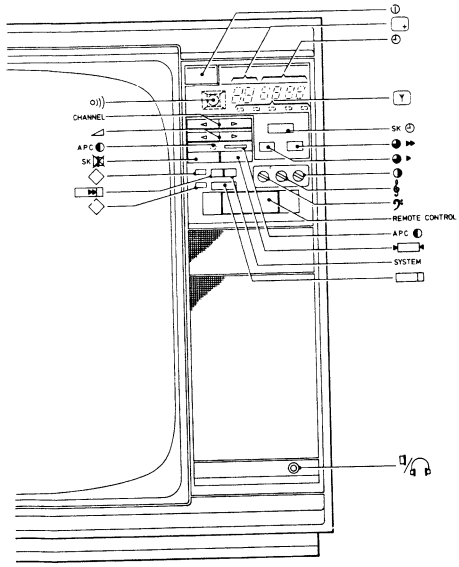
Service Manual

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.



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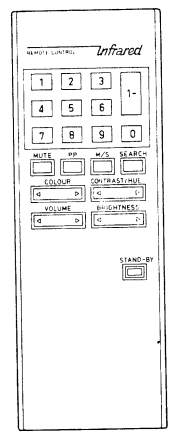


33 841B12

CHASSIS CTO-S

/50/57/65/67 CHAPTERS 1÷9,11,14÷16,18
/51/56 CHAPTERS 1÷10,12÷16,18
/59 CHAPTERS 1÷10,12,14÷16,18

CHASSIS CTO-N 4175

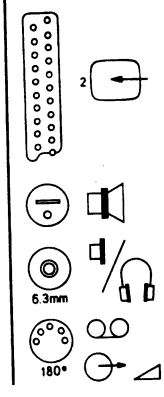
/51 CHAPTERS 1÷10,12÷16,18
/73 CHAPTERS 1÷9,11,14÷16,18
/80 CHAPTERS 1÷9,12,14÷16,18

160-276 V/100 W
and for /51, /56, /59
90-140, 160-276 V

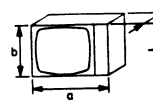
75 Ω coax.

A66-540X

4 Ω/10 W



8-600 Ω



axbxc
758x540x472 mm

/50/65/67 → PAL B/G
/57/73 → PAL I
/59/80 → PAL/SECAM
/51/56 → PAL/SECAM/NTSC

UV411	UV471
VHFa : 44- 92 MHz	
VHFb : 162-230 MHz	VHFb : 174-294 MHz
UHF : 470 862 MHz	UHF : 469-858 MHz

DocumentationTechnique Service Dokumentation Documentazione di Servizio Huolte-Ohje Manual de Servicio Manual de Serviçio

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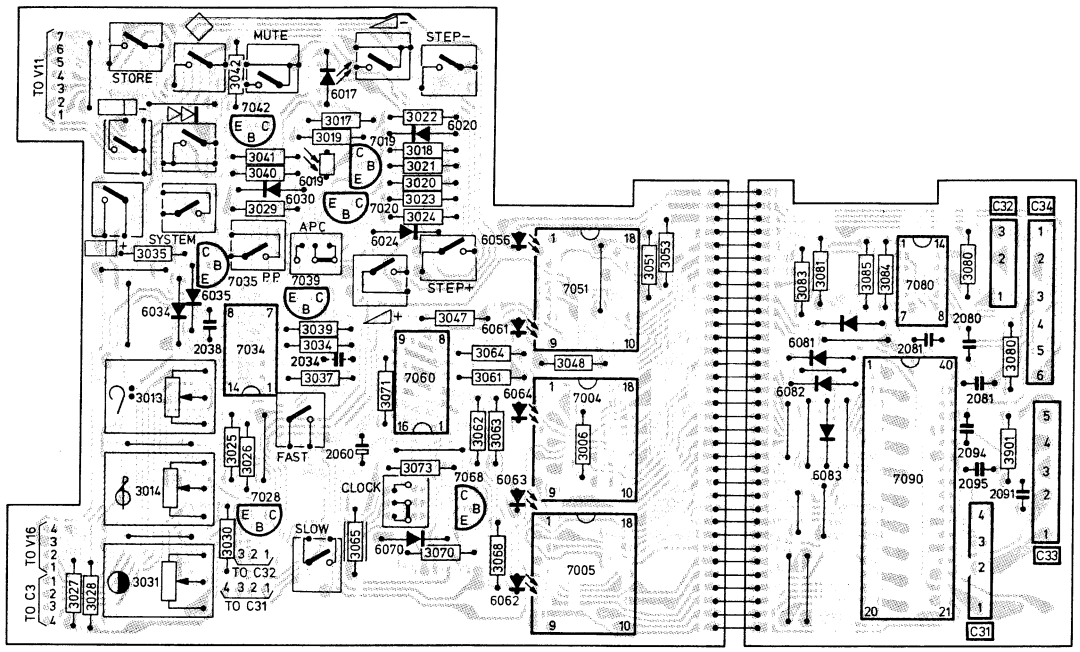
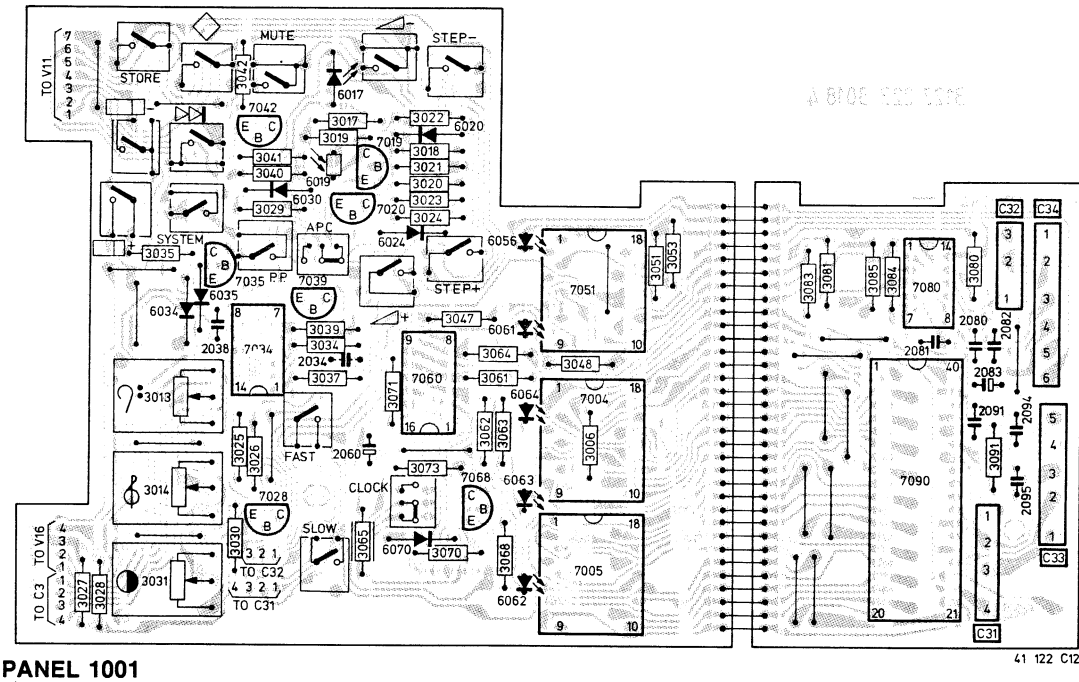
Consumer Electronics

CONTROL PANEL 1001 FOR CTO-S



37 505 C12/640

CONTROL PANEL 1001 FOR CTO-N



41 122 C12/639

CONTROL PANEL 1001

3065	4822 111 30515	0,33 W
3013, 3014	4822 101 20911	Potm. 47k lin
3031	4822 101 20912	Potm. 100k lin

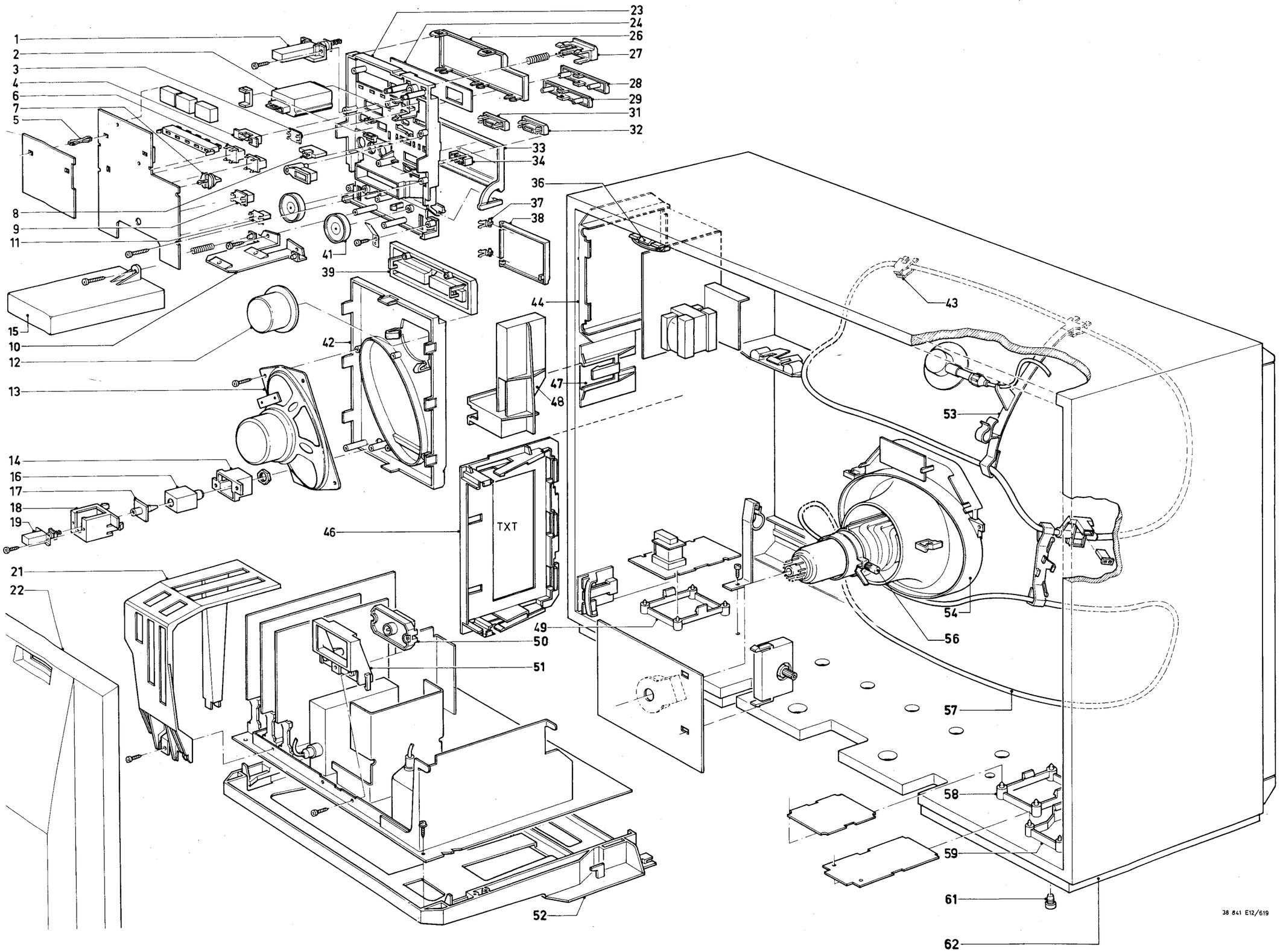
CQV61A-3	4822 130 32218	(GREEN)
CQV62-3	4822 130 32216	(YELLOW)
CQV60A-3	4822 130 32217	(RED)
LDR	4822 116 10038	
1N4148	4822 130 30621	
TLFG2110	4822 130 32658	

BC548	4822 130 40938	
BC558	4822 130 40941	

LN524RK	4822 130 90224
HEF4541BP	4822 209 10568
HEF4556BP	4822 209 10281
LN5261GAPH	4822 130 90193
N74LS164N	5322 209 81487
MM5387AAN	4822 209 10001

Various

VKS Switch	4822 276 10799
Switch APC/CLOCK	4822 276 11352
Socket display	4822 267 70095
Socket IC 14P	5322 267 54064
Socket IC 40P	5322 255 44217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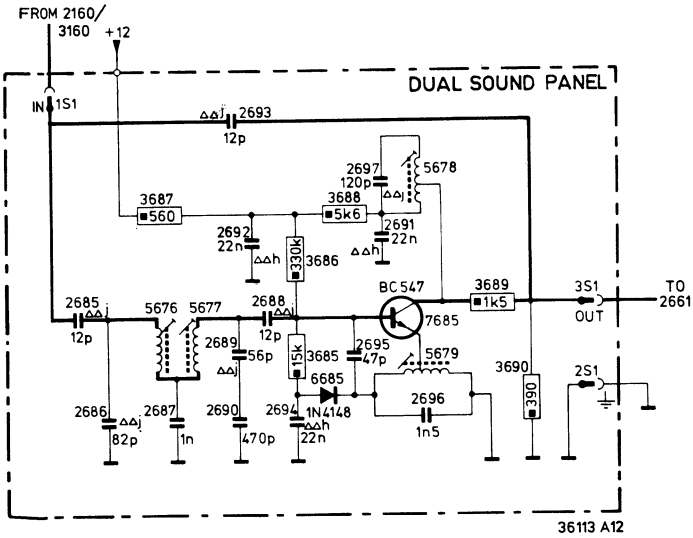
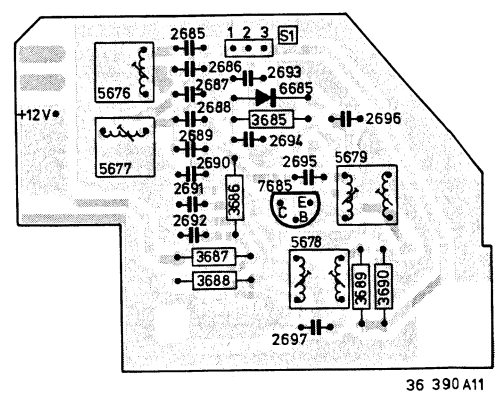
38 841 E12/619

1	4822 276 11256	Switch
2	4822 212 21449	Receiver RC5
3	4822 410 23949	Knob v.k.s.
4	4822 410 23953	Knob (on/off clock)
5	4822 401 10751	Spacer beween PCB's
6	4822 410 23955	Knob (slow/fast)
7	4822 410 23956	Knob
8	4822 410 23952	Knob APC
9	4822 410 23962	Knob (auto search)
10	4822 417 10824	Hinge control panel
11	4822 410 23948	Knob (store/execute)
12	4822 240 30294	Tweeter
13	4822 240 40172	Loudspeaker
14	4822 404 60166	Bracket
15	4822 432 30221	Housing
16	4822 267 10103	Jack
17	4822 462 40648	Cap
18	4822 404 30636	Holder
19	4822 276 10944	Switch
21	4822 404 30701	Holder
22	4822 438 40077	Rear cover
23	4822 459 60966	Front panel
24	4822 450 60489	Filter
26	4822 450 60487	Window
27	4822 410 23957	Knob (mains)
28	4822 412 10249	Knob (channel)
29	4822 410 23954	Knob (volume)
31	4822 410 23959	Knob (p.p.)
32	4822 410 23958	Knob (mute)
33	4822 432 91667	Door
34	4822 410 23961	Knob (manual search)
36	4822 404 30415	Block
37	4822 417 10825	Hinge
38	4822 432 91666	Door
39	4822 458 50269	Grille
41	4822 280 10135	Tweeter
42	4822 458 50271	Grille
43	4822 404 30235	Clip
44	4822 464 70163	Frame
47	4822 459 61107	Frame
48	4822 404 30796	Frame
49	4822 691 10135	Frame
50	4822 218 20276	Aerial unit
51	4822 466 91094	Block
52	4822 464 70326	Frame main panel
53	4822 401 10642	Strip
54	4822 150 10168	Deflection unit
56	4822 526 10171	Adjusting ring
57	4822 157 51645	Degaussing coil for CTO-S
57	4822 157 51055	Degaussing coil for CTO-N
58	4822 691 10135	Frame
59	4822 464 70338	Frame
61	4822 462 10121	Foot
62	4822 459 60965	Plinth
	4822 450 60488	Window APC
	4822 255 40414	Holder LED's
	4822 255 40415	Holder LDR
	4822 410 23951	Knob (fine tuning)
	4822 410 24005	Knob (for NTSC)
	4822 451 80771	Mask
	4822 218 20338	Aerial adaptor 300 to 75 Ω

1600 DUAL SOUND PANEL



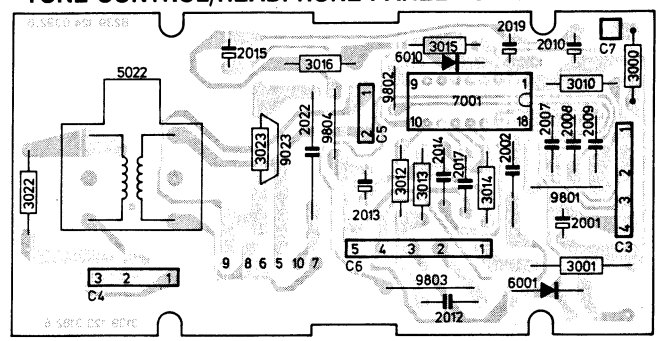


2696	4822 121 50925	
5676	4822 156 20819	
5677	4822 156 20819	
5678	4822 156 40705	
5679	4822 156 40706	
6685	4822 130 30621	1N4148
7685	4822 130 40959	BC547B

TONE CONTROL/HEADPHONE PANEL 1090

3001	4822 116 51106	560 Ω1.6W
3022	4822 116 51148	27Ω1.6W
5022	4822 140 60233	transformer
BZX79-C12	4822 130 34197	
TDA1524A/V2	4822 209 82233	
2010	4822 124 40435	10µF, 50V

TONE CONTROL/HEADPHONE PANEL FOR CTO-S



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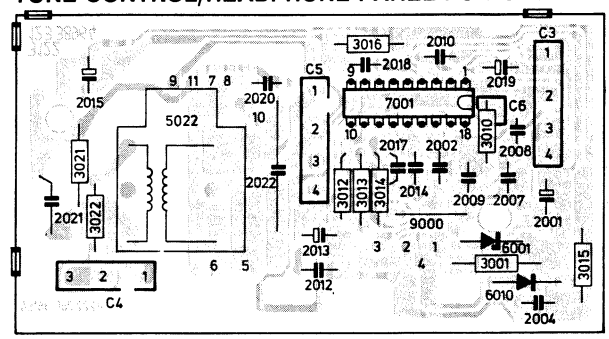
TONE CONTROL/HEADPHONE PANEL FOR CTO-N



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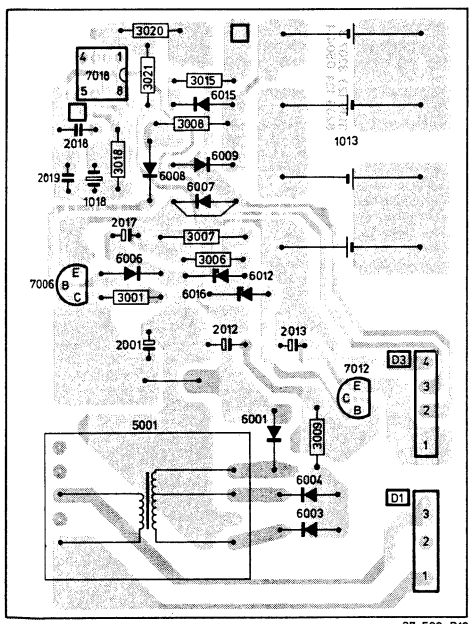
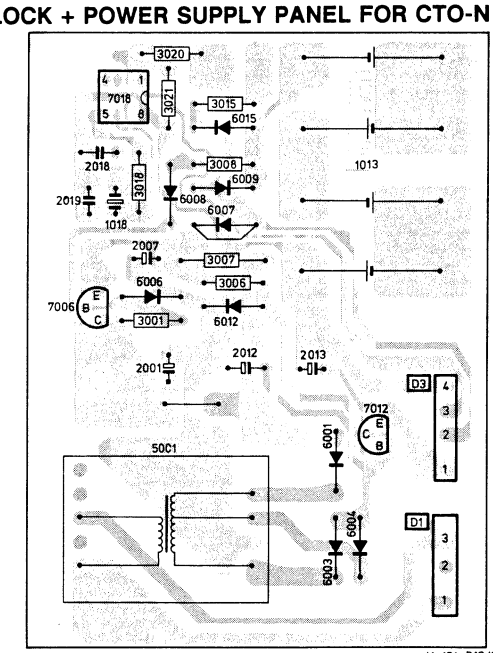
CLOCK + POWER SUPPLY PANEL FOR CTO-S



37 503 B12/640

CLOCK + POWER SUPPLY PANEL FOR CTO-N



41 121 B12/639

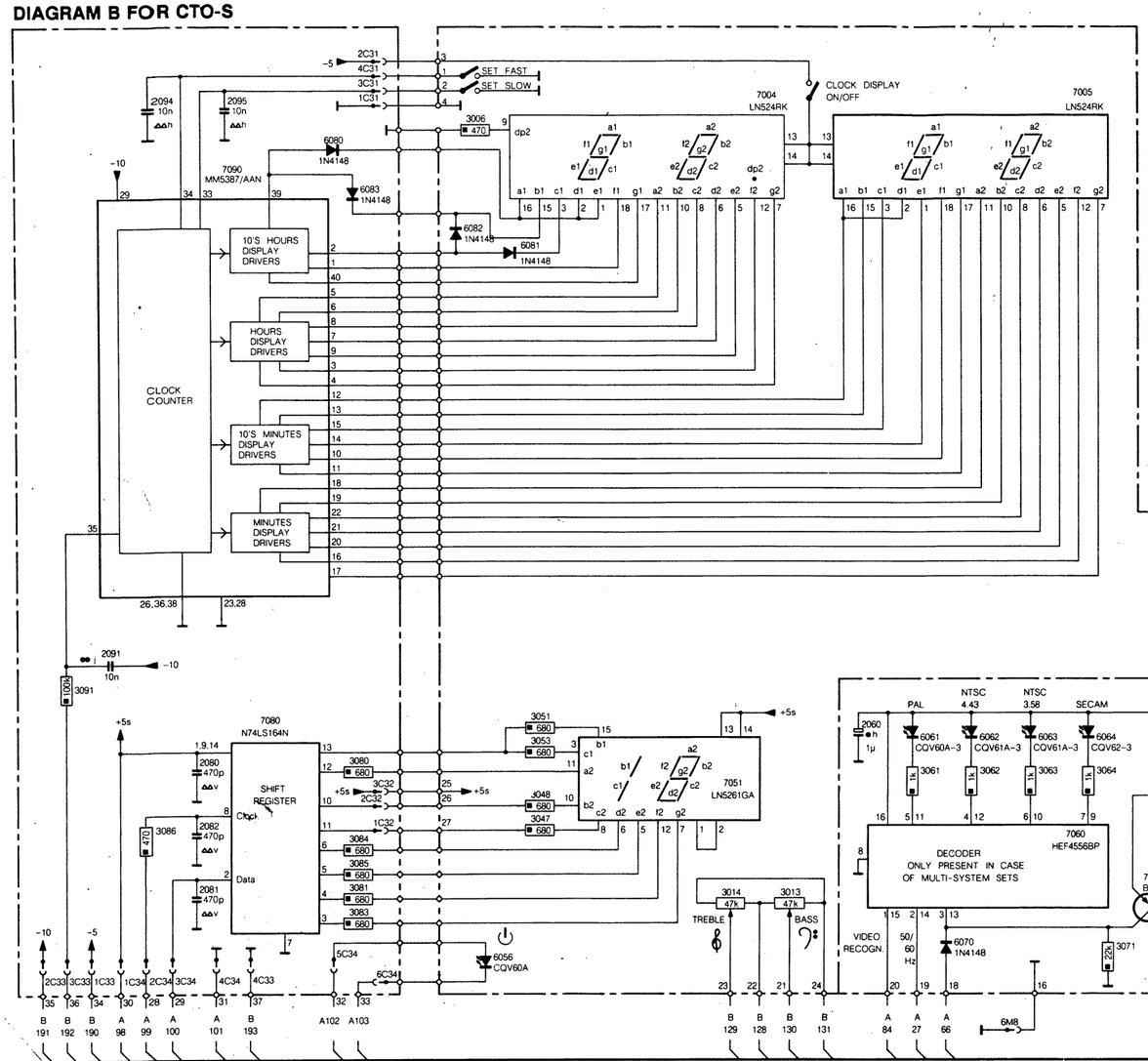
CLOCK + POWER SUPPLY 1070

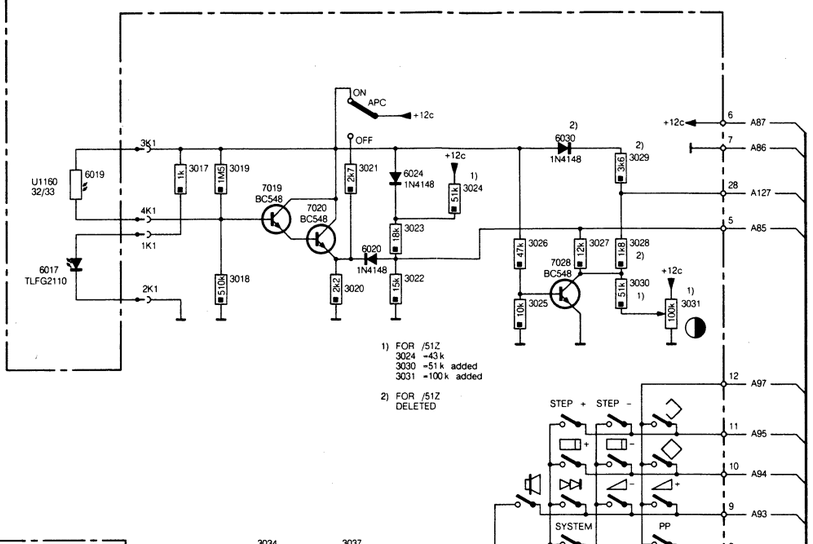
3007	5322 116 51676	9k1 1.6 W
3009	4822 111 30508	10R 0.33 W
5001	4822 146 10092	Transformer
1N5062	4822 130 41275	
1N4148	4822 130 30621	
BZX79-C11	4822 130 34488	
BZX79-C5V6	4822 130 34173	
BC327-40	4822 130 41327	
BC136	4822 130 40824	
MM5369EYR/N	4822 209 10488	

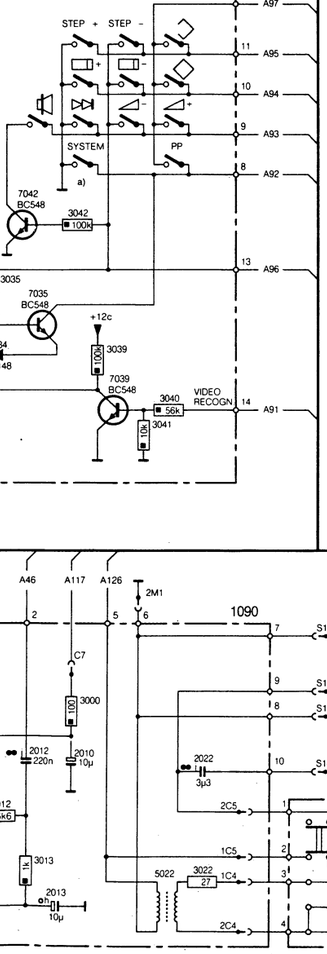
VARIOUS

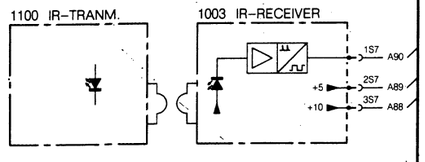
1013	4822 138 10032	Battery
1018	4822 242 70673	Crystal
2012	4822 124 40724	1000 µF, 35 V
2018	4822 125 50045	Cap. trimmer

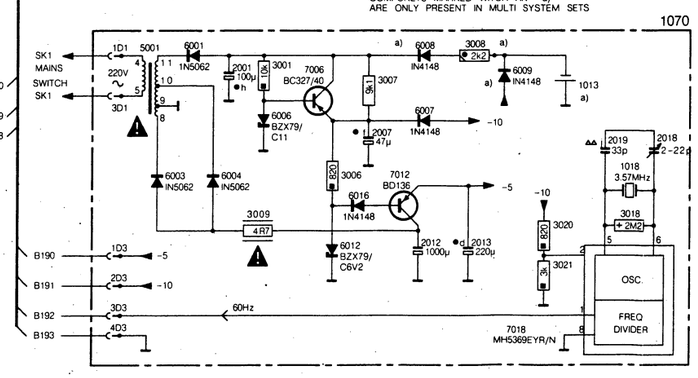
DIAGRAM B FOR CTO-S

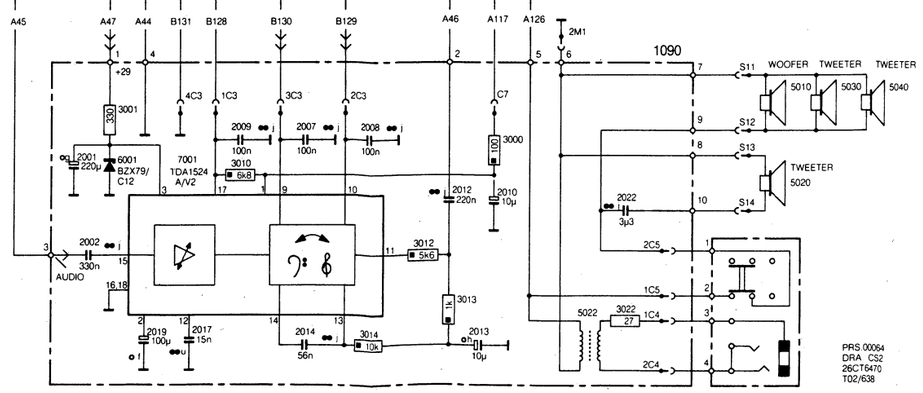






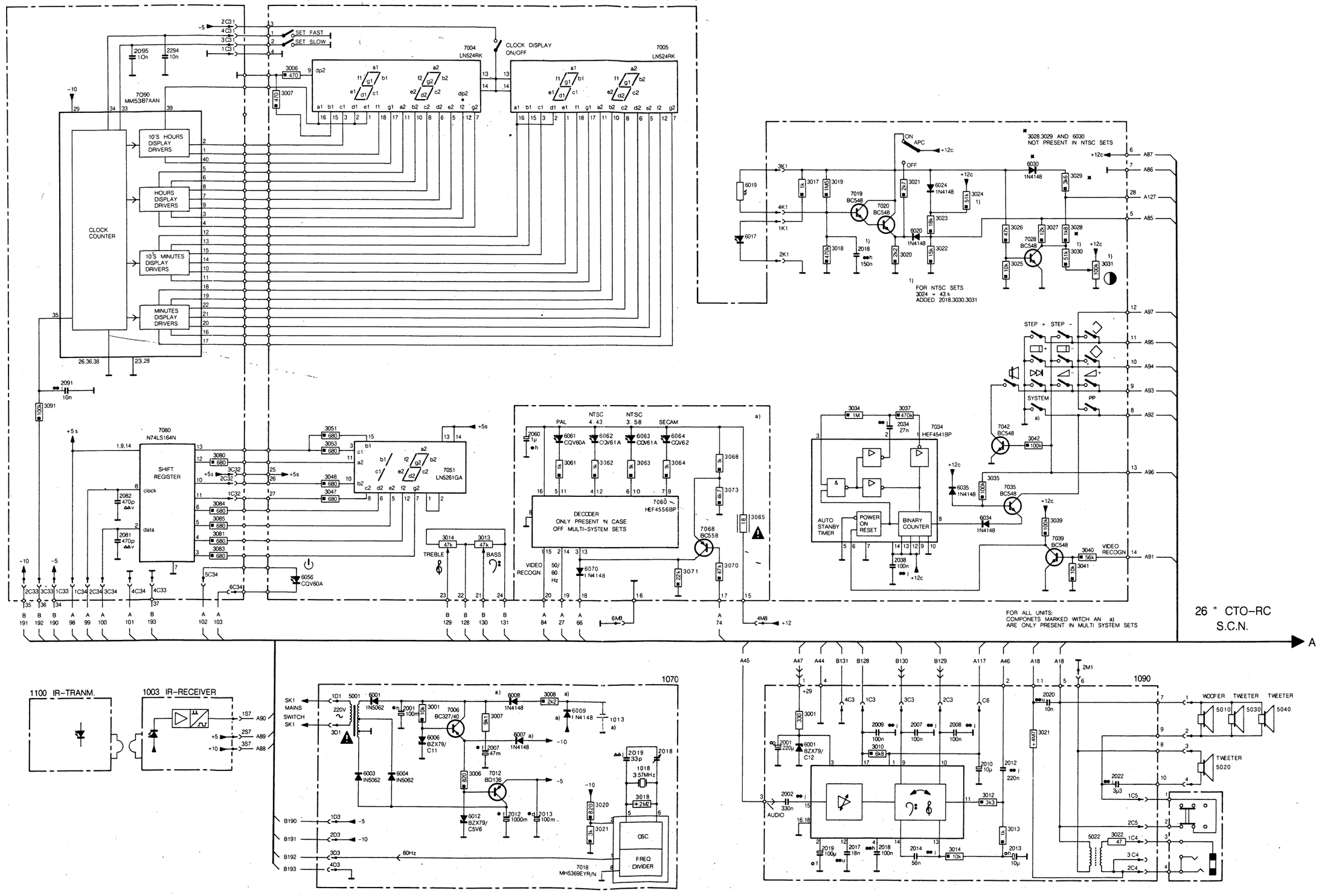


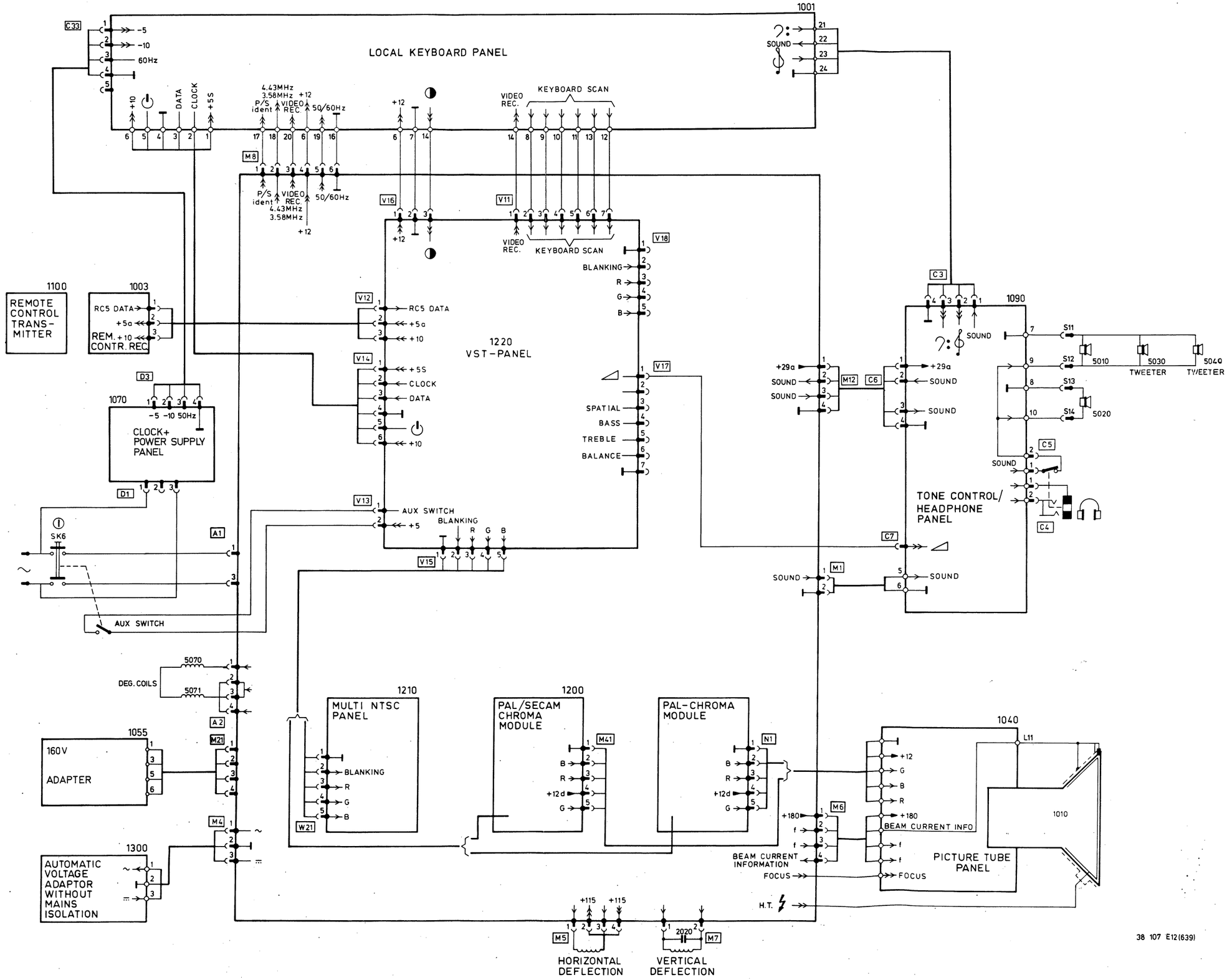




26 " CTO-RC S.C.S

DIAGRAM B FOR CTO-N





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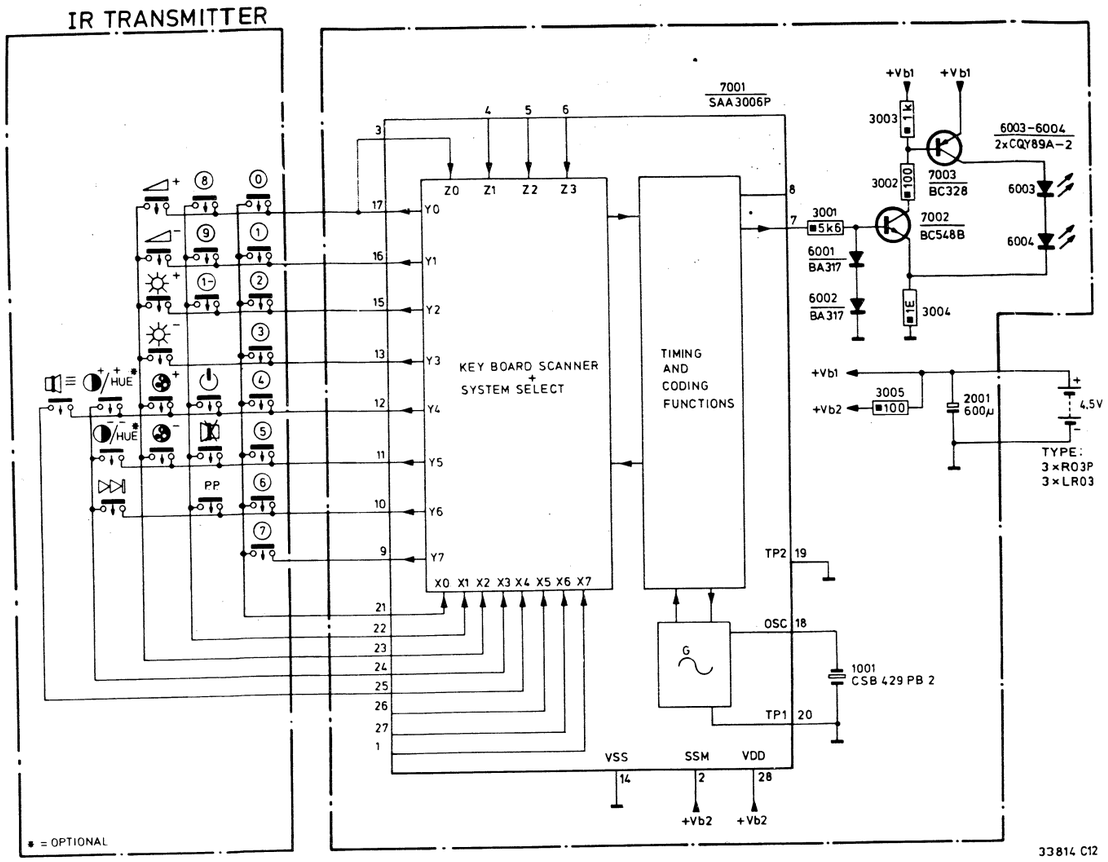
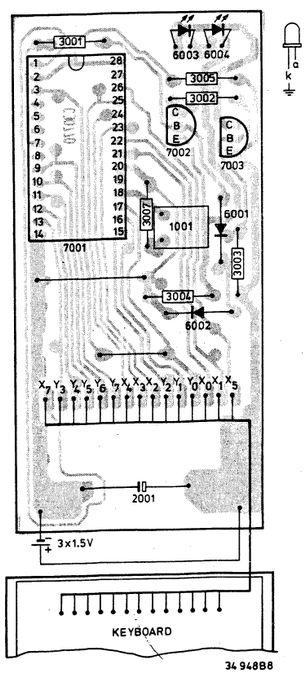
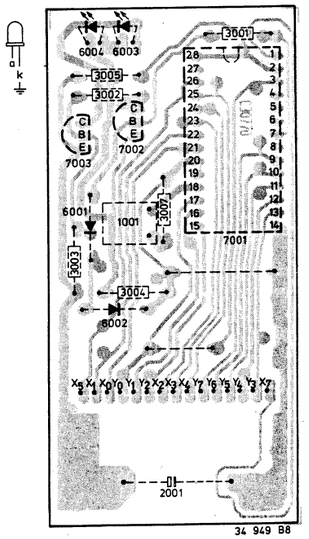
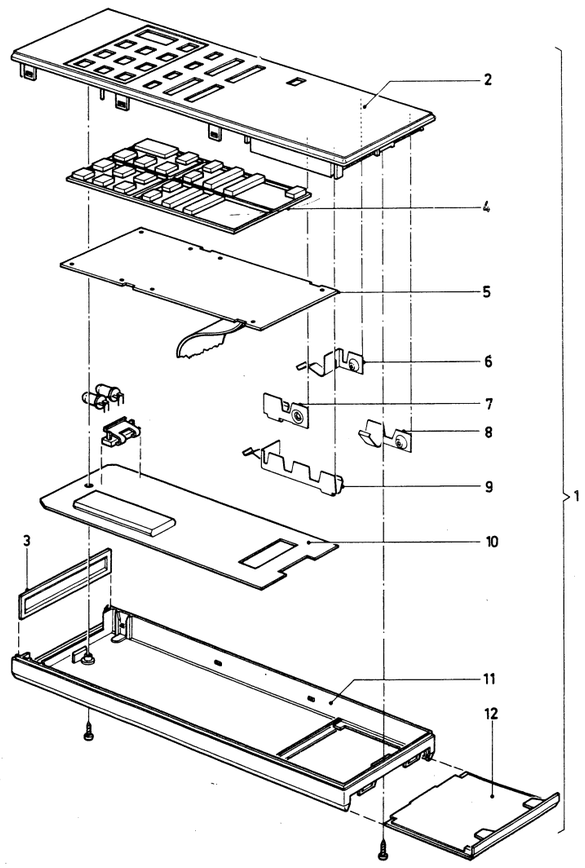


7001	4822 209 81891	SAA3006P
BC328 BC548B	4822 130 44104 4822 130 40937	
BA317	4822 130 30847	
CQY89A/II	4822 130 31332	
1001	4822 242 70675	CSB429PB2
2001	4822 124 21463	600 µF 8 V





1	4822 218 20501
1/51/56	4822 218 20376
2	4822 432 30265
2/51	4822 432 30262
2/56	4822 432 30264
3	4822 381 10692
4	4822 410 24806
5	4822 212 22461
6	4822 278 90506
7	4822 278 90508
8	4822 278 90507
9	4822 278 90509
10	4822 212 21898
11	4822 432 30188
12	4822 432 91449



Colour television CHASSIS CTO-N

Service
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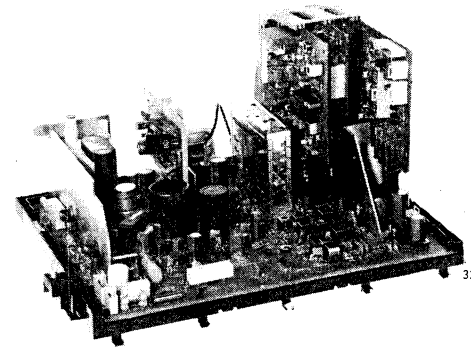

Only applicable for sets with strokenumbers /50/51/56/59 (SU serial numbers) and sets with strokenumbers /61/62/63/64/73/80/81/82/83 (local production)

Service Manual

TECHNICAL DATA

Mains voltage	: 230 V~ +20%/–30%
Mains voltage range (multivoltage)	: 90 - 140 V~ 160 - 276 V~
Mains frequency	: 50/60 Hz ± 5%
Systems /50/62	: PAL B/G
/73	PAL I
/59/61/62/63/64/80/83	PAL/SECAM
/51/56/81/82	PAL/SECAM/NTSC
Aerial input impedance	: 75 Ω - coax
Minimum aerial input VHF	: 30 µV
Minimum aerial input UHF	: 40 µV
Maximum aerial input	: 200 mV
Pull-in range colour sync.	: ± 300 Hz
Pull-in range horizontal sync.	: ± 600 Hz
Pull-in range vertical sync.	: ± 5 Hz
90° Picture tube	: 14", 16", 20"
110° Picture tube	: 26"
Automatic degaussing	
Adopted for video recorder	

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2 WARNINGS

1. Safety regulations require that, after repairs the set be restored to its original condition and that spare parts identical to those specified, be use.
2. For safety reasons, parts marked △ may be replaced only with the parts specified (for code numbers, see the parts lists).
3. To prevent ICs and transistors from being damaged, high-voltage flash-overs should be avoided.
   For checking the high-voltage, a suitable meter should be used.
   The picture tube should be discharged only as indicated in Fig. 1.
4. After having removed the rear panel check whether the chassis carries no voltage, by means of a voltmeter. Should the chassis be live, the receiver has to be connected to the mains via an isolating transformer.
5. Be careful when measuring the EHT-section and on the picture tube panel.
6. Never replace components when the set is being switched on.
7. Safety goggles must be worn when the picture tube is replaced.
8. Use plastic instead of metal tools for adjusting. This is necessary to avoid a short-circuit or to avoid that a circuit becomes unstable.
9. It may occur that at certain voltage measurements the supply voltage "hiccups" one time. Note that owing to this "hiccup" programme 1 is switched on in some versions.

3. ESD

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD).
Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

REMARKS

1. To gain better access to the components for trouble shooting and/or servicing, remove the chassis from the cabinet and place it on its side on the bench, resting on the heatsink. Disconnect the connector of the degaussing coil. Make sure the underground is of insulating material.
2. This service manual contains all basic data relating to the chassis.
   Data about the type of set can be found in the relevant service manual (the so-called apparatus sheet).
3. DC-voltages and oscillograms should be measured with respect to an earth-point on the monopanel as close as possible near the point to be measured.
4. DC-voltages have been measured as follows: An aerial signal, minimum brightness, maximum saturation and contrast (In position VHF III).
5. Oscillograms have been measured under the following conditions:
   a. Using a colour bar pattern as input signal (PM5515 or PM5519).
   b. Connect an oscilloscope (position 0.1 V/Div. DC) to point 16 of 7292 (PAL) or 7082 (PAL/SECAM) via an attenuation probe 10:1.
   c. Adjust the brightness control until the level of the black bar in the video signal is at 3 V (refer to Fig. 2).
   d. Turn the contrast control until the amplitude of the video signal is 2 V.
   e. Adjust the saturation control for 3 Vdc on pin 6 of TDA3561 (item no. 7292 (PAL) or 7082 (PAL/SECAM).
6. The picture tube print has printed spark gaps. Each spark gap has been inserted between an electrode of the picture tube and the aquadag coating.
7. Disconnection of the EHT cable and focus cable at the line output transformer can be achieved by levering the clamping bushes "k" up with a screwdriver or side-cutting pliers (Fig. 2a).
   When re-inserting the cable, the clamping bush should first be pressed on the transformer until a click is heard, after which the cable can be inserted.
   Introduce the cable as far as the second mark.
8. The focus pot has not been attached by soldering and may at any time be removed by simply releasing the fastening lugs.
   The focus cable may be detached after removal of the ceramic plate. The focus cable may now be simply inserted in the new focus pot and will be secured as soon as a click is heard.
9. The accessibility of chroma or secam modules may be improved by the use of an extender board.
   The codenumber for this extender is 4822 263 70117.

METHOD OF REPAIR

This documentation contains a method of repair in the form of a fault finding tree, enabling the technician - in a period that he is not yet familiar with the set - to locate faults quickly and efficiently. He should have an aerial or generator signal and a multipurpose meter at his disposal.

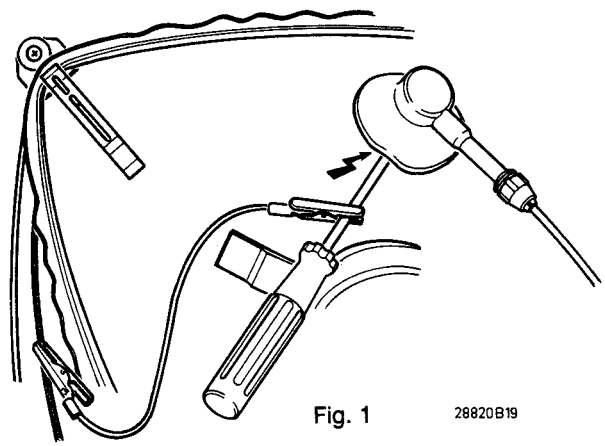

Fig. 1 28820B19

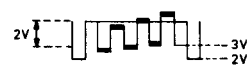

Fig. 2

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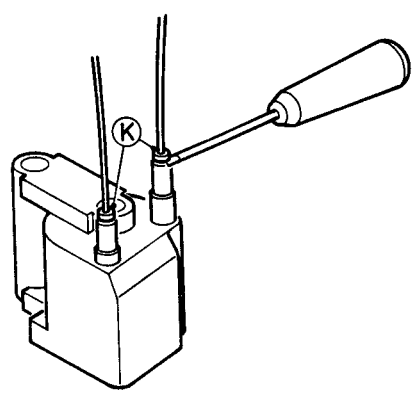

Fig. 2a 28768 A12.

A. △ ADJUSTING THE PICTURE (not for 21" and 26")

Remark:
The colour purity and convergence adjustments described hereafter need only be carried out if a completely new adjustment is called for or if a new picture tube has been fitted. Otherwise for instance after replacing the deflection unit, it will not be necessary to remove the rubber wedges (G in Fig. 3). Corrections by means of the multi-pole unit will then suffice.

I. Colour purity, see Fig. 3

1. Loosen fixing screw "F" of the deflection unit a few turns.
2. Move the deflection unit and remove the three rubber wedges "G".
3. Slide the deflection unit forward as far as possible against the glass of the picture tube cone and turn on fixing screw "F" in such a manner that the deflection unit can be moved with some friction.
4. Place the multi-pole unit in the position drawn, turn on screw "A" and turn securing ring "B" anti-clockwise.
5. Let the apparatus face East or West and switch-on the set.
   Supply a cross-hatch pattern and set brightness control to maximum. Allow for a warming-up time of 10 minutes.
6. Adjust the static convergence, using tags "C" and "D" (if necessary, see point II).
7. Turn SK9 for the vertical centring to its mid-position. Switch-off the green and the blue gun by loosening the resistors 3752 and 3754.
8. By turning the colour purity rings with tags "E", the vertical red bar is adjusted nearest to the centre of the screen, whilst also the central horizontal line should be as straight as possible.
9. Supply a white pattern signal and check that the red bar is in the centre of the screen indeed. If not, switch-on the cross-hatch pattern again and move the red bar in the right direction, taking care that the picture does not move too much in vertical direction.
10. Supply the white pattern signal and move the deflection unit until the whole picture surface is uniformly red.
11. Switch-on the green and the blue gun. No colour patches may occur in the white picture now obtained.
    In the affirmative, a minor connection can be made by slightly turning the colour purity rings "E" and/or slightly moving the deflection unit.
12. Turn on screw "F" tightly.
13. Adjust the vertical centring with SK9.
14. Proceed to the static and next the dynamic convergence adjustment.

II. Static convergence, see Fig. 3

1. Supply a cross-hatch pattern and allow for a warming-up time of 10 minutes.
2. Switch-off the green gun by loosening resistor 3752 and turn locking ring "B" anticlockwise.
3. By turning the four-pole rings with tags "C", the red and blue cross-hatch patterns in the centre of the screen are placed on top of each other.
4. Switch-on the green gun and switch-off the blue gun by loosening resistor 3754.
5. By turning the six-pole rings with tages "D" the red and green cross-hatch patterns in the centre of the screen are placed on top of each other.
6. Switch-on the blue gun again and tighten ring "B" again.

III. Dynamic convergence

Remark:
The dynamic convergence is achieved by vertical and horizontal tilting of the deflection unit. To secure the right position of the deflection unit, three rubber wedges are fitted between the glass of the picture tube cone and the deflection unit, as shown in Figs. 4d or 5d.
Two wedge thicknesses are available:
one 7 mm thick, code 4822 462 40356,
the other 11 mm thick, code 4822 462 40357.

1. First check the colour purity and the static convergence.
2. Supply a cross-hatch pattern and switch-off the green gun by loosening resistor 3752.
3. Eliminate the crossing of the central horizontal blue and red line and the crossing of the central vertical blue and red line, by vertical tilting of the deflection unit. If the position of the deflection unit is correct then place rubber wedge (1) paper strip not removed, at the top (Fig. 4a) or at the bottom (Fig. 5a).
   Fig. 4a is applicable if the deflection unit is tilted upwards and Fig. 5a if the unit is tilted downwards.
4. By horizontal tilting of the deflection unit, now both the horizontal blue and red lines in the upper and lower halves of the picture and the vertical blue and red lines on the left and right hand side of the picture are placed on top of the other.
   If the position of the deflection unit is correct, then place the wedges (2) and (3) with paper strips removed, as shown in Fig. 4b or 5b. Firmly press the adhesive sides of these wigs against the glass of the picture tube.
5. Now place wedge (4) as shown in Fig. 4c or 5c and press on the adhesive side firmly.
6. Remove wedge (1) so that the situation according to Fig. 4d or 5d occurs.
7. Switch-on the green gun.

B. 26": CONVERGENCE CORRECTIONS IN 30 AX SYSTEM

After replacing the picture tube or the deflection unit small convergence faults can be corrected as follows:
a. The horizontal red and blue lines in the upper and lower part of the picture can be made to coincide with potentiometer "A" (see Fig. 6).
b. After mounting a minipole onto the neck of the picture tube (see Fig. 1) the vertical red and blue lines in the left and right part of the picture can be made to coincide by turning knob "B".
   Codenumber of minipole is 4822 526 10171.

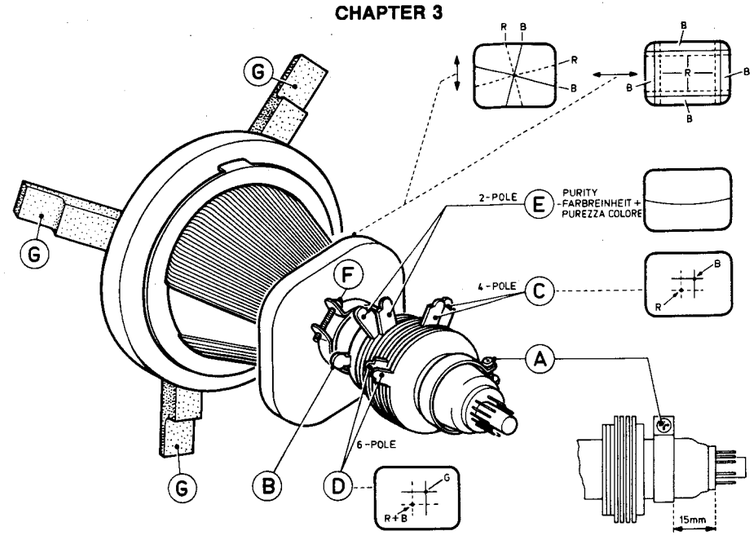

Fig. 3

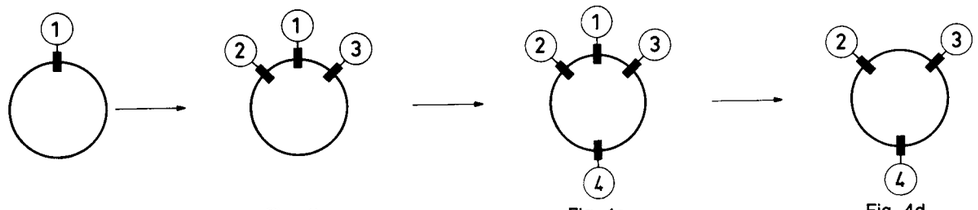

Fig. 4a Fig. 4b Fig. 4c Fig. 4d

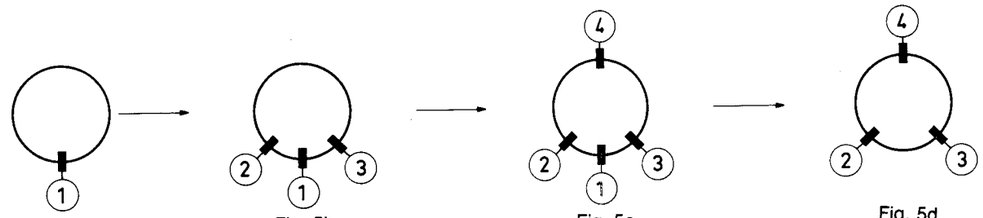

Fig. 5a Fig. 5b Fig. 5c Fig. 5d

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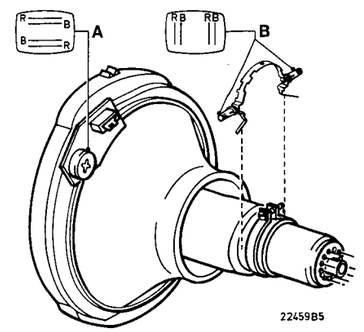


Fig. 6

Ⓐ ADJUSTMENTS

1. +115 V supply voltage

Connect a voltmeter (position DC) between point 1 of 5335 and chassis.
Adjust the meter reading to 115 V (tolerenace ± 1%) with 3325 in the supply circuit.

2. Horizontal synchronisation

Supply an aerial signal. Interconnect point 5 of 7875 to the chassis. Adjust 3871 until the picture stands straight.
Remove the interconnection.

3. Vertical synchronisation

Inject an aerial signal. Adjust 3813 until the picture stands still.
Connect the oscilloscope to pin 5 on 7400. Adjust the oscilloscope until the frame voltage pulse exhibits a width of 8 scale division.
Now connect pin 5 on 7875 to the chassis and adjust 3813 for a frame voltage pulse of 8.5 scale divisions.
Remove the connections.
If no oscilloscope is available, the following approximation method may be applied:
Connect pin 5 on 7875 to the chassis. Connect a 6M8 resistor parallel to 3813. Adjust 3813 for still picture.
Remove auxilliary resistor and disconnect pin 5 of 7875 from chassis.

4. Cut-off point of the picture tube

Not for 26":
Inject a white-picture signal to the aerial input.
Connect pin 2 on 1200 to the chassis (contrast = 0 V).
Adjust brightness until the voltage across 3701 equals 0 V.
Adjust 3705, 3721 and 3737 for a collector voltage of 125 V on 7704, 7720 and 7736.
Adjust 3759 to raise Vg2 until one colour has just disappeared. Now adjust the potentiometers in the emitter lines of the colour output amps until the other colours have also just disappeared. Remove the connection and check the grey scale adjustment.

For 26":
Inject a white-picture signal to the aerial input.
Connect pin 2 on 1200 to the chassis (contrast = 0 V).
Adjust brightness until the voltage across 3701 equals 0 V.
Adjust 3770, 3771, 3772 until the colours disappear.
Remove the connection and check the grey scale adjustment.

5. Grey scale adjustment

Apply a test pattern signal and set the receiver normally. Allow the set to warm up for approx. 10 minutes. Adjust 3735 and 3729 until the desired grey scale is attained.

6. HF-AGC

This circuit operates only if the aerial signals are very strong. If the picture of a local transmitter is shown in a distorted way 3152 must be so adjusted that the picture is no longer distorted.

7. Minimum sound intensity (only for 14"/16")

Adjust the sound intensity control of the operation section at minimum.
Adjust 3666 in such a way, that sound is just not audible.

8. Sound IF section

Apply a transmitter or generator signal, of which the sound carrier is modulated with one frequency (for instance 1000 Hz).
Adjust 5675 towards minimum interference in the sound (= maximum AM suppression). If there is no interference present in the sound it may be generated with a collector motor of which the interference is not suppressed.
In case of 4.5 MHz + 5.5 MHz sound IF (multisystem sets) adjust also 5672.

9. I.F. filter

Measurement conditions:
Select a channel in the UHF band so that the tuning voltage V_{vari} pin 6 of 1102 equals 17.5 V.
Connect pin 8 with pin 9 of 7151.
Apply 7.5 V to pin 14 on 7151.
Use an AM signal generator.
Connect this signal generator as shown in Figure 1.
Connect an oscilloscope or an HF millivoltmeter as shown in Figure 2.

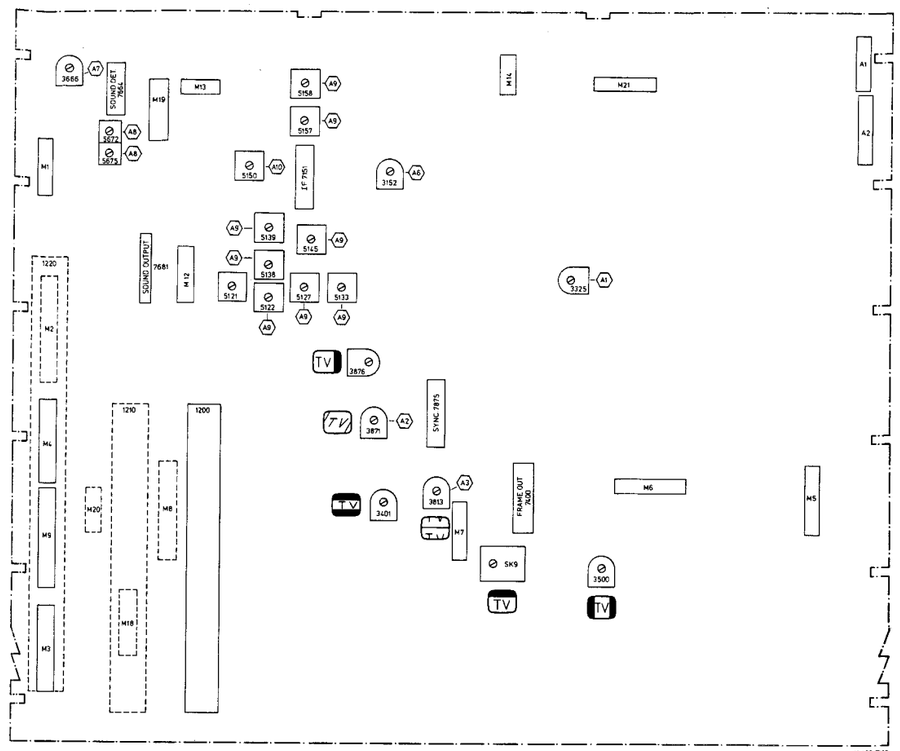
I.F. filter adjustment for B/G systems and NTSC/M
Frequency's for I systems are given between brackets.
If adjusting, always keep in mind that the I.F. detector must not be overloaded.
The first step is to adjust the suppression circuits for minimum output signal.
Set signal generator to 31.9 MHz and adjust 5127 for minimum reading at 31.9 MHz (31.5 MHz).
Set signal generator to 33.4 MHz and adjust 5138 for minimum reading at 33.4 MHz (33.5 MHz).
Set signal generator to 40.4 MHz and adjust 5139 for minimum reading at 40.4 MHz (41.5 MHz).
Set signal generator to 41.4 MHz and adjust 5133 for minimum reading at 41.4 MHz.
Set signal generator to 36.5 MHz (37.0 MHz) and successively adjust coils A (I.F. coil in tuner), 5122 and 5145 for maximum meter reading.
When setting now the signal generator to 38.9 MHz (39.5 MHz), the value measured should approximately equal one-half the maximum reading at 36.5 MHz (37.0 MHz).
If this is not the case, readjustment of 5122 and 5145 allows to achieve a small correction.
If a wobbulator is available, use it to display the response curve on the oscilloscope screen (see Figure 3).
For this, connect the wobbulator to the same point as the signal generator and leave the oscilloscope connected to the same point.
X-deflection for the oscilloscope should be provided by the wobbulator.
Corrections may be achieved by means of 5122 and 5145.
Eliminate the interconnection between the pins 8 and 9 on 7151.

I.F. detector
Amplitude-modulate the signal generator and tune into 38.9 MHz; now adjust 5157 for minimum reading in the dip between the two bumps.

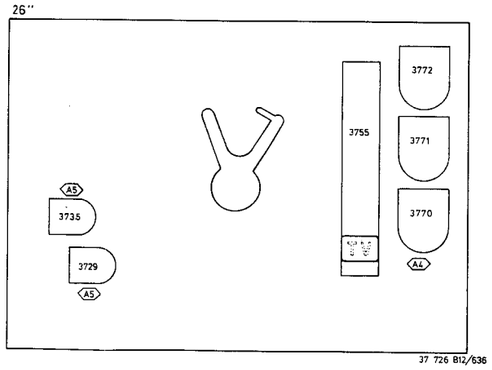
A.F.C.
Connect a DC voltmeter to pin 5 on 7151.
The A.F.C.-switch behind the door masking the tuning panel should be depressed.
Adjust 5158 for a meter reading of 8 V.

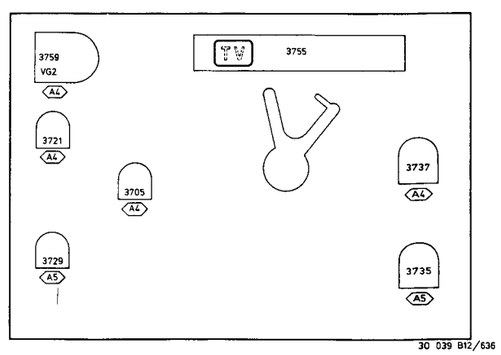
10. The sound suppression circuit in the luminance circuit

Apply a colour signal. The receiver is normally adjusted.
Adjusted 5150 so that no interference is visible in the picture.



26"





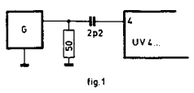


fig.1

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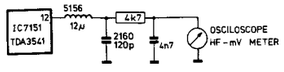

fig.2

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CHAPTER 5

2P	4822 276 20073	
3P	4822 276 30071	
4P	4822 276 30072	
5P	4822 276 30075	
6P	4822 276 30073	
7P	4822 276 40057	

2P	4822 265 20172	
3P	4822 265 30121	
4P	4822 265 30119	
5P	4822 267 40247	
6P	4822 265 30117	
7P	4822 265 40119	
9P	4822 267 60131	Vpp
15P	4822 267 60132	Vpp
19P	4822 267 60082	Vpp

BA484	4822 130 32214	
BAS11	4822 130 41273	
BAV21	4822 130 30842	
BY228	4822 130 41275	
BY448	5322 130 31559	
BY527	4822 130 31509	
BYD33D	4822 130 42488	
BYM56E	4822 130 80254	
BYT95A	4822 130 32193	
BYT95B	4822 130 32193	
BYV10/20	4822 130 31631	
BYV27/150	4822 130 31628	
BYV95A	4822 130 41601	
BYV95B	4822 130 41486	
BYV95C	4822 130 41487	
BZX75-2V1	4822 130 34049	
BZX79-B6V8	4822 130 34278	
BZX79-B22	4822 130 34441	
1N4148	4822 130 30621	
1N5062	4822 130 41275	

BC548	4822 130 40938	
BC558	4822 130 40941	
BC558B	4822 130 44197	
BC369	5322 130 44593	
BD234	4822 130 40917	
BF422	4822 130 41782	
BU508A	4822 130 43164	
ON769	4822 130 41436	
2SC3169PH	4822 130 41121	
2SD1577PV	4822 130 43921	
2SA1356	4822 130 60649	
2SC3795	4822 130 60648	

3101	4822 116 52083	15 kΩ 2.5 W
3101	4822 116 52084	22 kΩ 2.5 W

3103	4822 111 30515	18 Ω 0.33 W
3103	4822 116 52425	470 Ω 0.5 W
3103	4822 111 30515	33 Ω 0.33 W saf.
3112	4822 110 72192	1M5
3149	4822 111 30508	10 Ω 0.33 W saf.
3149	4822 111 30511	12 Ω 0.33 W saf.
3149	4822 111 30492	2.2 Ω 0.33 W saf.
3152	4822 100 10051	22 kΩ 0.1 W potm.
3153	4822 111 30513	15 Ω 0.33 W saf.
3325	4822 100 10035	10 kΩ 0.1 W potm.
3328	4822 110 72198	2.7 MΩ 0.2 W
3340	4822 116 51091	18 kΩ 2.5 W
3340	5322 116 55147	12 kΩ 2.5 W
3341	4822 116 51109	15 kΩ 2.5 W
3343	4822 116 30253	N.T.C.
3351	4822 111 30508	10 Ω 0.33 W saf.
3351	4822 111 30515	18 Ω 0.33 W saf.
3352	4822 111 30542	180 Ω 0.33 W saf.
3360	4822 116 60188	1 Ω 0.5 W saf.
3360	4822 111 30492	2.2 Ω 0.33 W saf.
3389	4822 116 40036	110/220 V PTC
3390	4822 116 40036	110/220 V PTC
3390	4822 116 40065	200 V PTC
3391	4822 122 32427	4.7 Ω 10 W
3392	4822 111 30544	220 Ω 0.33 W saf.
3393	4822 116 40036	110/220 V PTC
3394	4822 122 32427	4.7 Ω 10 W
3400	4822 116 51106	560 Ω
3401	4822 100 10075	100 Ω 0.1 W potm.
3404	4822 111 30492	2.2 Ω 0.33 W
3558	5322 113 44282	3.3 Ω 3.5 W
3558	4822 113 44282	2.4 Ω 4 W
3566	4822 116 86177	680 Ω
3561	4822 112 21052	8.2 Ω 3.5 W
3561	4822 113 80215	2.7 Ω 3.5 W
3561	5322 113 44282	3.9 Ω 4 W
3566	4822 116 80177	680 Ω 0.5 W
3583	4822 111 30499	4.7 Ω 0.33 W saf.
3590	4822 111 30494	2.7 Ω 0.33 W saf.
3590	4822 111 30483	1 Ω 0.5 W saf.
3664	4822 110 73109	1.2 kΩ 0.33 W
3666	4822 100 10029	2.2 kΩ 0.1 W potm.
3669	4822 116 51106	560 Ω 1.6 W
3669	4822 116 52389	100 Ω 0.5 W
3670	4822 111 30492	2.2 Ω 0.33 W saf.
3681	4822 111 30593	3.3 Ω 0.33 W saf.
3681	4822 111 30492	2.2 Ω 0.33 W saf.
3813	5322 101 14142	220 kΩ 0.5 W potm.
3814	4822 111 30513	15 Ω 0.33 W saf.
3814	4822 111 30515	18 Ω 0.33 W saf.
3871	4822 100 10035	10 kΩ 0.1 W potm.
3871	4822 101 20854	10 kΩ 0.5 W potm.
3876	4822 100 10035	10 kΩ 0.1 W potm.
3894	4822 116 52083	15 kΩ 2.5 W
3895	4822 116 52083	15 kΩ 2.5 W

5121	4822 156 21228	0.32 µH
5122	4822 157 51762	1.52 µH
5127	4822 157 51763	0.25 µH
5133	4822 157 51764	0.32 µH
5138	4822 157 51765	0.58 µH
5139	4822 157 51766	0.44 µH
5145	4822 156 20798	0.6 µH
5150	4822 156 20802	10.1 µH
5156	4822 157 50965	15 µH
5157	4822 156 20799	0.28 µH
5158	4822 156 21799	0.25 µH
5333	4822 158 10604	6.8 µH
5335	4822 140 10266	Switch mode trafo
5340	4822 157 51757	2 µH
5345	4822 157 51757	2 µH
5351	4822 142 60373	Line driver trafo
5355	4822 157 50963	2 µH
5392	4822 157 52143	27.4 µH
5393	4822 157 51757	4.7 µH
5507	4822 156 21293	1500 µH
5508	4822 157 51761	540 µH
5560	4822 156 21157	Deflection
5561	4822 158 10563	82 µH
5563	4822 157 51824	6 µH
5564	4822 140 30067	Line output trafo 26"
5564	4822 140 10254	Line output trafo
5585	4822 158 10101	5.3 µH
5590	4822 157 52077	5.6 µH
5672	4822 156 10743	12.5 µH
5675	4822 157 51767	8.4 µH

2111	4822 122 40553	22 nF
2112	4822 122 40553	22 nF
2113	4822 122 40553	22 nF
2158	4822 124 40434	22 µF 35 V
2318	4822 122 40553	22 nF 50 V
2320	4822 122 32074	100 pF 1000 V
2330	4822 124 21686	220 µF 385 V
2330	4822 124 40965	470 µF 400 V
2355	4822 122 32987	680 pF 500 V
2370	5322 124 40451	470 µF 250 V
2370	4822 124 20976	220 µF 200 V
2371	5322 124 40453	47 µF 385 V
2371	4822 124 40674	68 µF 385 V
2372	4822 124 40747	330 µF 63 V
2389	4822 121 41921	220 nF 250 V
2392	4822 122 40426	2.2 nF 1 kV
2393	4822 122 40426	2.2 nF 1 kV
2395	4822 122 40426	2.2 nF 1 kV
2396	4822 122 40426	2.2 nF 1 kV
2407	4822 124 41374	150 µF 6.3 V
2412	4822 124 40724	1000 µF 35 V
2507	4822 121 42968	27 nF 400 V
2508	4822 124 21226	4.7 µF 50 V

2560	4822 121 20225	330 nF 400 V
2560	4822 121 41919	470 nF 400 V
2567	4822 121 42418	9.1 nF 1.5 kV
2567	4822 121 40249	8.2 nF 1.6 kV
2567	4822 121 41334	10 nF 1.5 kV
2568	4822 122 32403	470 pF 2 kV
2569	4822 122 32569	220 pF 2 kV
2569	5322 122 54078	560 pF 2 kV
2570	4822 122 32403	470 µF 2 kV
2583	4822 124 41279	47 µF 250 V
2663	4822 122 40553	22 nF 50 V
2664	4822 122 40553	22 nF 50 V
2669	4822 122 40553	22 nF 50 V
2683	4822 124 40435	10 µF 50 V
2813	4822 122 40553	22 nF 50 V
2814	4822 122 32987	680 pF 500 V
2865	4822 124 40435	10 µF 50 V
2870	4822 121 50879	2.2 nF 160 V
2870	4822 121 50955	3.3 nF 160 V
2890	4822 124 40435	10 µF 50 V

HZT33	4822 130 30959	Ref. diode
TBA120S	4822 209 82399	Sound IF
TDA3540	4822 209 10939	IF + video
TDA2577A	4822 209 81464	Sync.
TDA2611AQ	4822 209 80444	Sound output
TDA3541/N5	4822 209 82414	IF + video
TDA3651AQ	4822 209 83263	Frame output
TDA3652Q	4822 209 82802	Frame output

Various

	4822 218 20338	Aerial adapter 300 Ω-75 Ω
	4822 492 60063	Fuse holder
1060	4822 273 30206	Switch SKg
	4822 320 20114	Focus cable
	4822 320 20115	EHT cable
1102	4822 210 40257	Tuner UV411
	4822 218 20276	Aerial unit
1102	4822 210 40159	Tuner ELC2004
1102	Local ordering	Tuner UV471
1661	4822 121 40543	Filter 5.5 MBP
1661	4822 242 70279	Filter 6.0 MBP
1662	4822 242 70319	Filter 6.5 MBP
1662	4822 242 70737	Filter 4.5 MBP
1391	4822 253 30026	Fuse T2.5A
1391/26"	4822 253 30027	Fuse T3.15A

3704/14"/16"	4822 116 51091	18 kΩ	2.5 W		
3704/20"	5322 116 54989	10 kΩ	2 W		
3704/26"	4822 113 80212	8,2 kΩ	7 W		
3705/14"/16"	4822 101 20838	4,7 kΩ	0.05 W	potm.	
3705/20"	4822 100 10036	4,7 kΩ	0.1 W	potm.	
3720/14"/16"	4822 116 51091	18 kΩ	2.5 W		
3720/20"	5322 116 54989	10 kΩ	2 W		
3720/26"	4822 113 80212	8,2 kΩ	7 W		
3721/14"/16"	4822 101 20838	4,7 kΩ	0.05 W	potm.	
3721/20"	4822 100 10036	4,7 kΩ	0.1 W	potm.	
3729/14"/16"	4822 100 20149	2,2 kΩ	0.05 W	potm.	
3729/26"/20"	4822 100 10029	2,2 kΩ	0.1 W	potm.	
3735/14"/16"	4822 100 20149	2,2 kΩ	0.05 W	potm.	
3735/26"/20"	4822 100 10029	2,2 kΩ	0.1 W	potm.	
3736/14"/16"	4822 116 51091	18 kΩ	2.5 W		
3736/20"	5322 116 54989	10 kΩ	2 W		
3736/26"	4822 113 80212	8,2 kΩ	7 W		
3737/14"/16	4822 101 20838	4,7 kΩ	0.05 W	potm.	
3737/20"	4822 100 10036	4,7 kΩ	0.1 W	potm.	
3751	4822 116 52399	1,5 kΩ	0.5 W		
3751/20"/26"	4822 111 90434	1,5 kΩ	0.5 W		
3752	4822 116 52399	1,5 kΩ	0.5 W		
3752/20"/26"	4822 111 90434	1,5 kΩ	0.5 W		
3753	4822 116 52399	1,5 kΩ	0.5 W		
3753/20"/26"	4822 111 90434	1,5 kΩ	0.5 W		
3754	4822 116 52399	1,5 kΩ	0.5 W		
3754/20"/26"	4822 111 90434	1,5 kΩ	0.5 W		
3755/20"/14"/16"	4822 101 10345	24MΩ	potm.		
3755/26"	4822 101 10488	24MΩ	potm.		
3759/20"	4822 101 10127	4,7MΩ	0.5 W	potm.	
3760	4822 116 52399	1,5 kΩ	0.5 W		
3760/20"/26"	4822 111 90434	1,5 kΩ	0.5 W		
3770/26"	4822 100 10586	4,7MΩ	0.3 W		
3771/26"	4822 100 10586	4,7MΩ	0.3 W		
3772/26"	4822 100 10586	4,7MΩ	0.3 W		
3773/26"	4822 111 90434	1,5 kΩ	0.5 W		
3774/26"	4822 111 90434	1,5 kΩ	0.5 W		
3775/26"	4822 111 90434	1,5 kΩ	0.5 W		
3776/26"	5322 116 64132	1MΩ	0.25 W		

5750/26"	4822 157 52682	335	µH
5750/20"/14"/16"	4822 157 52885	15	µH
5751/20"/14"/16"	4822 157 52885	15	µH

BAS11	4822 130 41273
BA317	4822 130 30847
1N4148	4822 130 30621
BC558	4822 130 40941
BF583	4822 130 60143
BF422	4822 130 41782
BF869	4822 130 41773

Various

4822 255 70176 valve holder

DIFFERENCE LIST FOR 14" AND 16" SETS

Set	/50S	/51S	/61S	/62S	/62T	/64S	/73S	80S	/81S
14CT6020 Pb	–	–	–	–	–	–	X	–	X
14CT6416 Vst	–	–	–	–	X	–	–	–	–
14CT6421 Vst	–	–	–	–	–	–	X	–	X
16CT6025 Pb	X	–	–	X	X	X	X	X	X
16CT6425 Vst	–	X	–	–	–	–	–	–	X
16CT6426 Vst	–	X	X	–	X	X	X	–	X
1102 tuner UV4..	411	411	411	–	–	–	471	411	411
1102 tuner ELC	–	–	–	ELC	ELC	ELC	–	–	–
1103 SAW filter	–	–	–	–	–	X	–	–	–
1200 PAL B/G	X	–	–	X	–	–	–	–	–
1200 PAL-I	–	–	–	–	–	–	X	–	–
1200 PAL/SECAM	–	X	X	–	X	X	–	X	X
1210 NTSC	–	X	–	–	–	–	–	–	X
1300 multi-volt.	–	X	–	–	–	–	–	X	X
1661 filter .. MHz	5.5	5.5	5.5	5.5	5.5	5.5	6.0	5.5	5.5
1662 filter .. MHz	–	4.5	–	–	–	–	–	–	4.5
1045 mains filter	–	X	–	–	–	–	–	X	X
2109	4n7	4n7	4n7	–	–	–	4n7	4n7	4n7
2112	22n	22n	22n	22n	22n	22n	–	22n	22n
2114	–	10p	–	–	–	–	–	–	10p
2115	–	10p	–	–	–	–	–	–	10P
2137	2p2	2p2	2p2	3p3	3p3	–	12p	2p2	2p2
2145	6p8	6p8	6p8	4p7	4p7	–	6p8	6p8	6p8
2155 vst	–	2u2	2u2	–	2u2	2u2	2u2	–	2u2
2158	22u	22u	22u	47u	47u	47u	22u	22u	22u
2370	–	220u	–	–	–	–	–	220u	220u
2389 14"	–	–	–	–	220n	–	220n	–	220n
2389 16"	220n	220n	220n	220n	220n	220n	470n	220n	220n
2390	–	220n	–	–	–	–	–	220n	220n
2393	–	–	–	–	–	–	2n2	–	–
2395	–	–	–	–	–	–	2n2	–	–
2396	–	–	–	–	–	–	2n2	–	–
2583 pb 14"	–	–	–	–	–	–	22u	–	22u
2583 vst 14"	–	–	–	–	22u	–	22u	–	47u
2673 vst	–	22n	22n	–	22n	22n	22n	–	22n
2673 pb 14"	–	–	–	–	–	–	15n	–	15n
2673 pb 16"	12n	–	–	12n	12n	12n	12n	12n	12n
2674 vst	–	10n	10n	–	10n	10n	10n	–	10n
2675 vst 16"	–	33u	33u	–	33u	33u	33u	–	33u
2675 14"	–	–	–	–	33u	–	33u	–	33u
2677 pb	15n	–	–	15n	15n	15n	15n	15n	–
2677 vst	–	220p	220p	–	220p	220p	220p	–	220p
2810	–	120n	–	–	–	–	–	–	120n
2811	680n	560n	680n	680n	680n	680n	680n	680n	560n
2870	2n2	3n3	2n2	2n2	2n2	2n2	2n2	2n2	3n3
3101 pb	22k	–	–	22k	22k	–	22k	–	22k
3101 vst	–	15k	15k	–	15k	15k	15k	–	15k
3103	18R	18R	18R	470R	470R	470R	18R	18R	18R
3105 vst	–	10k	10k	–	10k	10k	10k	–	10k
3108	10R	10R	10R	100R	100R	100R	–	10R	10R
3113	10R	10R	10R	–	–	–	10R	10R	10R
3116	–	–	–	150R	150R	150R	–	–	–
3121	0R	56R	0R	0R	0R	0R	0R	0R	56R
3122	82R	22R	82R	82R	82R	68R	82R	82R	22R
3123	–	3k3	–	–	–	–	–	–	3k3
3124	–	10k	–	–	–	–	–	–	10k
3145 vst	12k	–	12k	12k	12k	12k	12k	12k	–
3156	180R	180R	180R	330R	330R	330R	180R	180R	180R

Set		/50S	/51S	/61S	/62S	/62T	/64S	/73S	80S	/81S
3157		2k7	2k7	2k7	1k	1k	1k	2k7	2k7	2k7
3158	16"	10k	10k	10k	2k2	2k2	2k2	10k	10k	10k
3362 vst	14"	–	–	–	–	–	–	12k	–	12k
3362 vst	16"	–	12k	12k	–	12k	12k	12k	–	12k
3365 vst	14"	–	–	–	–	–	–	10k	–	10k
3365 vst	16"	–	10k	10k	–	10k	10k	10k	–	10k
3368 vst	14"	–	–	–	–	–	–	56R	–	56R
3368 vst	16"	–	56R	56R	–	56R	56R	56R	–	56R
3391	16"	4R7	4R7	4R7	–	–	4R7	4R7	4R7	4R7
3391	14"	–	–	–	–	–	–	–	–	–
3393	14"	–	–	–	–	–	–	–	–	110/220
3394 ELC		–	–	–	4R7	4R7	–	–	–	–
3394	14"	–	–	–	–	4R7	–	4R7	–	4R7
3394	16"	–	–	–	4R7	4R7	–	–	–	–
3566	16"	–	–	–	–	–	–	680R	–	–
3566	14"	–	–	–	–	680R	–	680R	–	–
3663		–	1k2	–	–	–	–	–	–	1k
3664		–	1k2	–	–	–	–	–	–	1k
3665 pb	14"	–	–	–	–	–	–	0R	–	0R
3665 vst	16"	–	–	–	–	–	–	24k	–	–
3667 vst		–	22k	22k	–	22k	22k	22k	–	22k
3668 vst	14"	–	–	–	–	–	–	22k	–	22k
3668 vst	16"	–	22k	22k	–	22k	22k	22k	–	22k
3673 vst	16"	–	47k	47k	–	47k	47k	47k	–	47k
3673 vst	14"	–	–	–	–	–	–	47k	–	47k
3816		–	15k	–	–	–	–	–	–	15k
3817		–	2k2	–	–	–	–	–	–	2k2
3870		36k	20k	36k	36k	36k	36k	36k	36k	20k
3873		–	220k	–	–	–	–	–	–	220k
3880 pb		–	–	–	–	–	–	–	–	1k
3880 vst		–	1k	1k	–	1k	1k	1k	–	1k
3894		15k	15k	27k	15k	15k	27k	15k	15k	15k
3895		15k	15k	22k	15k	15k	22k	15k	15k	15k
5121 ..uH		–	0.32	–	–	–	–	–	–	0.32
5672 ..uH		–	12.5	–	–	–	–	–	–	12.5
5675 ..uH		8.4	8.4	8.4	8.4	8.4	8.4	6.7	8.4	8.4
6102	BA484	–	X	–	–	–	–	–	–	X
6103 ELC	1N4148	–	–	–	X	X	X	–	–	–
6392	BY527	X	X	X	X	X	X	–	X	X
6392	1N5062	–	–	–	–	–	–	X	–	–
6393	1N5062	–	X	–	–	–	–	X	X	X
6394	1N5062	–	X	–	–	–	–	–	X	X
6395	1N5062	–	–	–	–	–	–	X	–	–
6396	1N5062	–	–	–	–	–	–	X	–	–
6661	1N4148	–	X	–	–	–	–	–	–	X
6662	1N4148	–	X	–	–	–	–	–	–	X
6665 vst	1N4148	–	X	X	–	X	X	X	–	X
6873	1N4148	–	X	–	–	–	–	–	–	X
7151	TDA5340	–	–	–	X	X	X	–	–	–
7151	TDA5341	X	X	X	–	–	–	X	X	X
7368 vst	BC548	–	X	X	–	X	X	X	–	X
7877	BC548	–	X	–	–	–	–	–	–	X
Jumper C pb		cl	–	–	cl	cl	cl	cl	cl	cl
Jumper C vst		–	–	–	–	–	–	–	–	–
Jumper D		cl	–	cl	cl	cl	cl	–	–	cl
Jumper E pb		cl	cl	cl	cl	cl	cl	cl	cl	cl
Jumper E vst		–	–	–	–	–	–	–	–	–
(cl = closed)										

* Items only present when marked with "X"

DIAGRAM A

CHANNEL SELECTOR

1200 PAL OR PAL/SECAM PA

1210 NTSC PANEL

SUPPLY

SYNCHRONISATION

HORIZONTAL

AUTOMATIC MULTIVOLTAGE 1) ADAPTER PANEL WITHOUT MAINS SEPARATION

ALL VOLTAGES MEASURED WITH RESPECT TO POINT A.
.V → MAINSVOLTAGE 220V (..V) → MAINSVOLTAGE 110V

MAINS FILTER 1045

1220 VST-PANEL

SOUND DEMODULATOR

FIGURES IN TUNER CORRESPOND TO THOSE OF OTHER TUNERS

1210 NTSC PANEL 1)

1200 PAL OR PAL/SECAM PANEL 1)

1040 R-G-B AMPLIFIER

SEE SERVICE MANUAL . REMARKS

HORIZONTAL

EAST-WEST

VERTICAL

SOUND DEMODULATOR

IN CASE NO HEADPHONE CONNECTION IS USED
1S2 CONNECTED TO 1M1
2S2 CONNECTED TO 2M1

1) FOR REMARKS SEE SERVICE MANUAL

CTO-N 14"/16"

PRS 01741
T02/702

	1001	N 4	2880	H 9	3701	D29	7302	K 5
	1010	B34	2890	F11	3703	D29	7303	K 3
	1020	G33	2891	F10	3704	D30	7321	I 16
	1040	A28	2895	H 7	3705	E29	7322	J15
	1045	M 6	3001	G 2	3706	E31	7323	J16
	1102	B 2	3098	M31	3707	E30	7330	J19
A	1102	M 8	3101	E 5	3708	E30	7331	J19
	1103	A 2	3103	A 3	3709	A29	7353	H16
	1111	M31	3104	E 6	3710	B29	7355	G19
	1200	A22	3105	E15	3711	A29	7368	H15
	1210	A18	3106	J27	3720	B30	7400	G32
	1220	M12	3108	E 2	3721	C29	7508	H27
	1300	I 7	3109	E 2	3722	C30	7510	I 28
	1391	G 3	3110	E 4	3723	C31	7514	F27
	1661	M22	3111	E 3	3724	C30	7562	G23
	1662	N21	3112	D 6	3725	E29	7565	H22
	2001	N 5	3113	D 3	3726	C28	7664	N23
	2002	M 5	3121	B 5	3727	D28	7681	N29
	2101	E 5	3122	B 5	3729	D29	7704	D30
	2103	B 3	3123	C 7	3735	C28	7711	A29
	2106	J28	3124	D 7	3736	A30	7720	C30
	2109	D 3	3127	B 7	3737	B30	7736	A30
	2110	D 4	3139	B 9	3738	B30	7875	G13
	2111	E 3	3145	M15	3739	B31	7877	J 9
	2112	D 1	3146	C 9	3740	B30	SK1	H 2
C	2113	D 2	3147	B16	3751	C33	SK9	F33
	2114	B 5	3148	C16	3752	C31		
	2115	B 5	3149	J27	3753	D31		
	2122	B 5	3150	B15	3754	A31		
	2124	B 7	3151	B16	3755	D33		
	2127	B 7	3152	E12	3756	D33		
	2130	B 8	3153	D11	3758	D33		
	2131	B 7	3154	E11	3759	D33		
	2137	B 8	3155	E14	3760	C32		
D	2138	B 8	3156	D10	3810	K10		
	2145	B 9	3157	D10	3811	K11		
	2146	D 9	3158	E10	3813	K10		
	2147	C10	3159	D12	3814	J27		
	2148	C10	3160	C15	3816	K 9		
	2150	A11	3161	D12	3817	K 9		
	2151	J28	3165	E12	3860	I 9		
	2152	E12	3301	J 2	3862	F 9		
	2153	E11	3302	K 2	3868	G10		
	2154	E11	3303	K 4	3869	F10		
E	2155	E14	3304	J 4	3870	G12		
	2156	E15	3305	J 5	3871	F11		
	2158	E10	3306	J 5	3872	G 8		
	2159	D13	3307	J 3	3873	J11		
	2160	C15	3308	K 3	3874	K12		
	2301	J 2	3309	J 6	3875	I 8		
	2302	K 2	3310	J 3	3876	K13		
	2303	K 4	3311	J 4	3877	J 8		
	2304	J 5	3312	K 4	3878	K14		
	2305	K 6	3313	K 3	3879	I 9		
F	2306	K 6	3314	K 5	3880	I 8		
	2307	K 7	3315	K 5	3890	F11		
	2315	I 17	3316	J 6	3894	G 6		
	2317	I 14	3316	H14	3895	G 6		
	2318	J17	3317	I 15	3896	G 7		
	2319	J16	3318	I 15	5001	N 5		
	2320	H17	3319	F16	5010	Q32		
	2321	H18	3320	K14	5094	M31		
	2323	I 18	3321	J16	5097	G25		
G	2325	I 18	3322	I 17	5098	F 2		
	2327	J18	3323	J18	5121	B 5		
	2328	K18	3324	I 18	5122	A 6		
	2330	H 6	3325	J17	5127	C 7		
	2334	H20	3326	K18	5133	A 8		
	2335	K19	3327	K18	5138	C 9		
	2340	H16	3328	K18	5139	A 9		
	2351	G17	3329	K18	5145	B 9		
	2355	F19	3330	I 18	5150	A15		
	2356	G15	3331	H18	5156	C14		
H	2358	F18	3332	H19	5157	A12		
	2360	G22	3334	I 19	5158	A13		
	2361	F22	3335	K19	5333	G18		
	2370	H 5	3336	I 19	5335	F21		
	2371	I 22	3337	K20	5340	F19		
	2389	G 3	3338	H15	5345	H20		
	2390	F 3	3339	I 16	5351	G17		
	2392	G 5	3340	G17	5355	F18		
	2392	F 6	3341	F17	5392	G 4		
	2393	G 5	3342	K19	5507	H26		
I	2395	G 6	3343	K19	5508	H26		
	2396	F 5	3351	G17	5561	I 23		
	2400	G31	3352	G19	5562	G23		
	2405	I 32	3355	G16	5563	G22		
	2407	K33	3360	F21	5564	F24		
	2410	K31	3362	G14	5585	J25		
	2412	I 26	3365	H14	5590	I 25		
	2413	H29	3368	H15	5672	O23		
	2421	J34	3390	F 3	5675	O24		
J	2500	L27	3391	G 5	5750	C32		
	2501	L26	3392	G 4	5751	C32		
	2505	K30	3393	F 4	6101	E 4		
	2507	H24	3394	G 5	6102	C 5		
	2508	I 26	3400	G31	6103	O 9		
	2509	H28	3401	K33	6159	D13		
	2510	G28	3404	I 26	6301	J 3		
	2512	H28	3405	H33	6302	I 3		
	2515	G28	3406	J33	6303	K 2		
K	2560	H25	3407	J33	6304	K 3		
	2565	G26	3408	J32	6305	J 6		
	2567	H24	3409	K32	6306	K 7		
	2568	G23	3410	I 30	6315	I 17		
	2569	G24	3411	I 33	6316	H18		
	2570	G24	3412	J33	6317	K14		
	2582	K26	3413	I 29	6318	J16		
	2583	K27	3414	J30	6320	G15		
	2585	J26	3419	G34	6321	I 16		
	2587	J27	3421	K34	6322	K15		
L	2588	I 26	3500	L27	6323	I 19		
	2590	I 25	3501	L28	6325	I 20		
	2661	M21	3505	K31	6334	H20		
	2663	O22	3507	H27	6337	K20		
	2664	O22	3508	I 28	6360	F22		
	2665	O27	3510	H28	6392	G 5		
	2667	M24	3511	G28	6392	F 6		
	2668	M26	3512	G28	6393	H 6		
	2669	M25	3513	H28	6393	F 5		
	2673	N26	3514	F26	6394	H 7		
M	2674	N26	3515	H28	6395	F 6		
	2675	M27	3520	G25	6396	F 5		
	2676	N27	3535	I 27	6400	G32		
	2677	N27	3558	G21	6500	K26		
	2678	O28	3561	G21	6507	H23		
	2679	M29	3562	H22	6510	G26		
	2680	O29	3563	H22	6564	H23		
	2681	O30	3564	I 22	6566	H22		
	2682	N30	3565	H26	6583	K26		
N	2683	O27	3583	K24	6585	J26		
	2713	E31	3590	I 24	6590	I 25		
	2729	C31	3661	M21	6661	M20		
	2745	B31	3662	N22	6662	N20		
	2753	C33	3663	M20	6664	M24		
	2810	K10	3664	N21	6665	N26		
	2811	K10	3665	N26	6667	M21		
	2812	J28	3666	M24	6668	M21		
	2813	J28	3667	M26	6705	D30		
	2814	G13	3668	M27	6721	C30		
O	2860	F11	3669	M25	6737	A30		
	2865	J 9	3670	M29	6873	J11		
	2866	K12	3673	M27	6895	H 6		
	2868	F10	3675	O24	7150	B16		
	2869	F 9	3678	O28	7151	B14		
	2870	F11	3681	O30	7165	E12		
	2876	H 9	3683	O28	7301	J 4		

DIAGRAM A

CHANNEL SELECTOR

SUPPLY

SYNCHRONISATION

HORIZONTAL

1210 NTSC PANEL 1)

1200 PAL OR PAL/SECAM PA

AUTOMATIC MULTIVOLTAGE 1) ADAPTER PANEL WITHOUT MAINS SEPARATION

ALL VOLTAGES MEASURED WITH RESPECT TO POINT A.
V → MAINSVOLTAGE 220V (..V) ~MAINSVOLTAGE 110V

IN CASE OF FULL WAVE RECTIFIER ADD THIS DIAGRAM I.S.O. D6392 ALONE

ONLY FOR R.C. SETS

MAINS FILTER 1055 1)

1220 VST-PANEL 1)

KEYBOARD SCAN

ONLY FOR STANDARD R.C. SETS

1210 NTSC PANEL

1200 PAL OR PAL/SECAM PANEL

1040 R-G-B AMPLIFIER

SEE SERVICE MANUAL . REMARKS

HORIZONTAL

EAST-WEST

VERTICAL

SOUND DEMODULATOR

1) FOR REMARKS SEE SERVICE MANUAL

CTO-N 20" ASYM

PRS.01749
T02/702

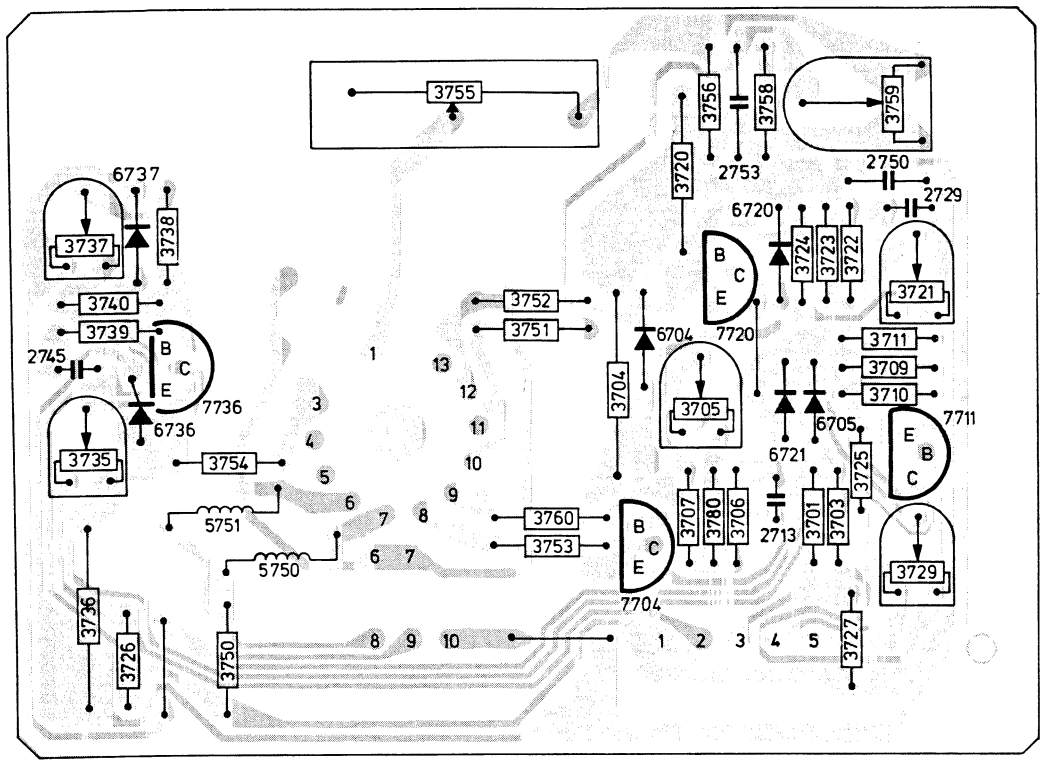
	1001	O 2	2880	H 9	3683	O32	7301	K 4
	1010	B34	2890	F11	3701	D29	7302	K 5
	1020	G33	2891	F10	3703	D29	7303	K 3
	1040	A28	2895	H 7	3704	D30	7321	I 16
	1051	A 2	3001	G 2	3705	E29	7322	K15
	1055	N 4	3101	E 5	3706	E30	7323	J16
	1102	B 2	3103	A 3	3707	E30	7330	J19
	1200	A22	3104	E 6	3708	E30	7331	J19
	1210	A18	3105	E14	3709	A28	7353	H16
	1220	M12	3106	J27	3710	B28	7355	G19
	1300	I 7	3108	E 2	3711	A29	7368	H15
	1391	G 3	3109	E 2	3720	B30	7400	G32
	1661	M26	3110	E 4	3721	C29	7508	H27
	1662	N26	3111	E 3	3722	C30	7510	I 28
	2001	O 3	3112	D 6	3723	C30	7514	F26
	2002	N 3	3113	D 3	3724	D30	7562	G23
	2101	E 5	3121	B 5	3725	E29	7565	H22
	2103	B 3	3122	B 5	3726	C28	7664	N28
	2106	J28	3123	C 7	3727	D28	7681	N33
	2109	D 3	3124	D 7	3729	D29	7704	D30
	2110	D 4	3127	B 7	3735	C28	7711	A29
	2111	E 3	3139	B 9	3736	A30	7720	C30
	2112	D 1	3145	M15	3737	B29	7736	A30
	2113	D 2	3146	C 9	3738	B30	7875	G13
	2114	B 5	3147	B16	3739	B30	7877	J 9
	2115	B 5	3148	C16	3740	B30	SK1	H 2
	2122	B 5	3149	J27	3751	C33	SK9	F33
	2124	B 7	3150	B15	3752	C30		
	2127	B 7	3151	B16	3753	D30		
	2130	B 8	3152	E12	3754	A30		
	2131	B 7	3153	D11	3755	D32		
	2137	B 8	3154	E11	3756	D33		
	2138	B 8	3155	E14	3758	D33		
	2145	B 9	3156	D10	3759	C33		
	2146	D 9	3157	D10	3760	C32		
	2147	C10	3158	E10	3810	K10		
	2148	C10	3159	D12	3811	K11		
	2150	A11	3160	C15	3813	L10		
	2151	K28	3161	D12	3814	J27		
	2152	E12	3165	E12	3816	K 9		
	2153	E11	3301	J 2	3817	K 9		
	2154	E11	3302	K 2	3860	I 9		
	2155	E14	3303	K 4	3862	G 9		
	2156	E15	3304	J 4	3868	G10		
	2158	E10	3305	J 5	3869	F10		
	2159	D13	3306	J 6	3870	G12		
	2160	C15	3307	J 3	3871	F11		
	2301	J 2	3308	K 3	3872	G 8		
	2302	K 2	3309	J 6	3873	J11		
	2303	K 4	3310	J 3	3874	K12		
	2304	J 5	3311	J 4	3875	I 8		
	2305	K 6	3312	K 4	3876	K13		
	2306	K 6	3313	K 3	3877	J 8		
	2307	K 7	3314	K 5	3878	K14		
	2315	I 17	3315	K 5	3879	I 9		
	2317	I 14	3316	J 6	3880	I 8		
	2318	J17	3316	H14	3890	F11		
	2319	J16	3317	I 15	3894	G 6		
	2320	H17	3318	I 15	3895	G 6		
	2321	H18	3319	F16	3896	G 7		
	2323	I 18	3320	K14	5001	N 3		
	2325	I 18	3321	J16	5097	H25		
	2327	J18	3322	I 17	5098	F 2		
	2328	K18	3323	J18	5121	B 5		
	2330	H 6	3324	I 18	5122	A 6		
	2334	H20	3325	J17	5127	C 7		
	2335	K19	3326	K18	5133	A 8		
	2340	H16	3327	K18	5138	C 9		
	2351	G17	3328	K18	5139	A 9		
	2355	F19	3329	K18	5145	B 9		
	2356	G15	3330	I 18	5150	A15		
	2360	G22	3331	H18	5156	C14		
	2361	F22	3332	H19	5157	A12		
	2370	H 5	3334	I 19	5158	A13		
	2371	I 22	3335	K19	5333	G18		
	2389	G 3	3336	I 19	5335	F21		
	2390	F 3	3337	K20	5340	F19		
	2392	G 5	3338	H18	5345	H20		
	2392	F 6	3339	I 16	5351	G17		
	2393	G 5	3340	G17	5355	F18		
	2395	G 6	3341	F17	5392	G 4		
	2396	F 5	3342	H19	5393	H 3		
	2400	G31	3343	K19	5507	H26		
	2405	I 31	3351	G17	5508	H26		
	2407	K32	3352	G19	5561	I 23		
	2410	K31	3355	G16	5563	G22		
	2411	G30	3360	F21	5564	F24		
	2412	I 26	3362	G14	5585	J25		
	2413	H29	3365	H14	5590	I 25		
	2421	J33	3368	H15	5672	O27		
	2500	L27	3390	F 3	5675	O28		
	2501	L26	3391	G 5	5750	C32		
	2505	K30	3392	G 4	5751	C32		
	2507	H24	3393	F 4	6101	E 4		
	2508	I 26	3400	G31	6102	C 5		
	2509	H28	3401	K32	6141	C22		
	2510	G28	3404	I 26	6159	D13		
	2512	H28	3405	H33	6301	I 3		
	2515	G28	3406	J33	6302	I 3		
	2535	I 27	3407	J33	6303	K 2		
	2560	H25	3408	J32	6304	K 3		
	2565	G26	3409	K32	6305	J 6		
	2567	H24	3410	I 30	6306	K 7		
	2568	G23	3411	I 33	6315	I 17		
	2569	G23	3412	J32	6316	H18		
	2570	G24	3413	I 29	6317	K14		
	2582	K26	3414	J29	6318	K16		
	2583	K27	3419	G34	6320	G15		
	2585	J26	3421	K34	6321	I 16		
	2587	J27	3500	L27	6322	K15		
	2588	I 26	3501	L28	6323	I 19		
	2590	I 25	3505	K31	6325	I 20		
	2661	M25	3507	H26	6334	H20		
	2663	O26	3508	I 28	6337	K20		
	2664	O26	3510	H27	6360	F22		
	2665	O31	3511	G28	6392	G 5		
	2667	N28	3512	G27	6392	F 6		
	2668	M30	3513	H28	6393	H 6		
	2669	M29	3514	F26	6393	G 5		
	2673	N30	3515	H27	6394	H 7		
	2674	N30	3520	G26	6395	G 6		
	2675	M31	3535	I 26	6396	F 5		
	2676	N31	3558	G21	6400	G32		
	2677	N31	3561	G21	6500	K26		
	2678	O32	3562	H22	6507	H23		
	2679	M33	3563	H22	6508	H26		
	2680	O33	3564	I 21	6510	G26		
	2681	O34	3565	H26	6564	H23		
	2682	M34	3566	I 23	6566	H22		
	2683	O32	3583	K25	6583	K26		
	2713	E31	3590	I 25	6585	J26		
	2729	C31	3661	M25	6590	I 25		
	2745	B31	3662	N26	6661	M24		
	2753	C33	3663	M24	6662	N24		
	2810	K10	3664	N25	6664	M28		
	2811	K10	3665	O30	6665	N30		
	2812	J28	3666	M28	6667	N26		
	2813	J28	3667	M30	6668	M26		
	2814	G13	3668	M31	6705	D30		
	2860	F11	3669	M29	6721	C30		
	2865	J 9	3670	M33	6737	A30		
	2866	K12	3673	M31	6873	J11		
	2868	F10	3675	O29	6895	H 6		
	2869	F 9	3677	O26	7150	B16		
	2870	F11	3678	O32	7151	B14		
	2876	H 9	3681	O34	7165	E12		

DIFFERENCE LIST FOR 20" ASYM SETS

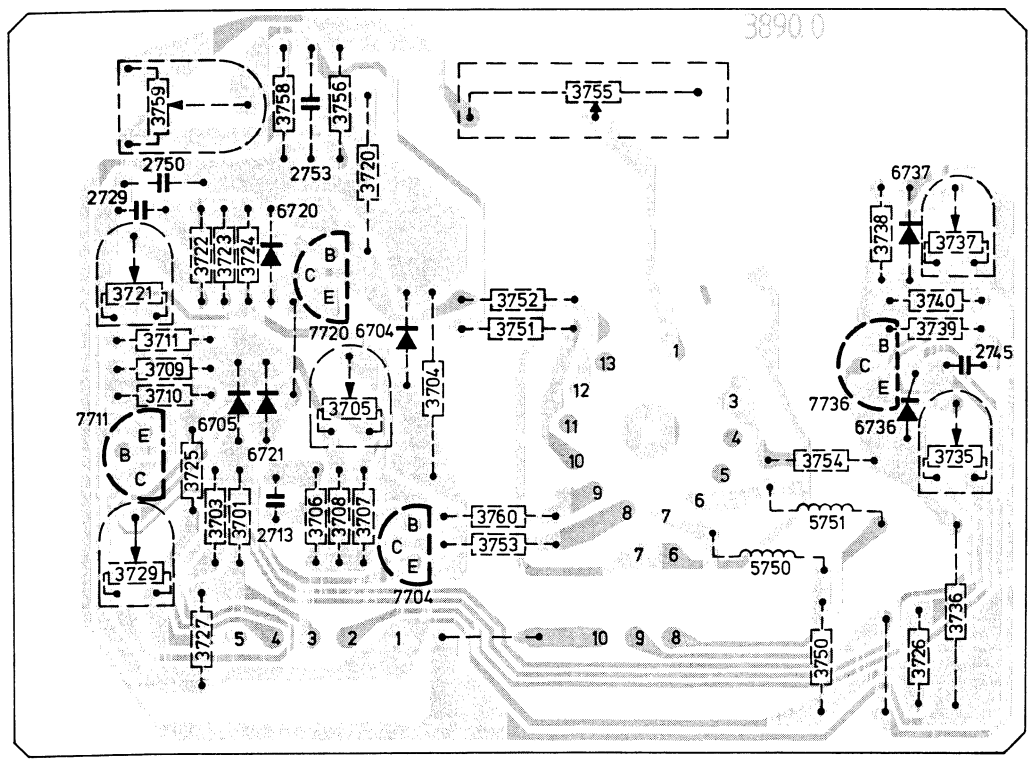
Item	/51	/59	/61	/63	/64	/73	/80	/81	/82	/83	
20CT6050	X	–	–	X	X	X	X	X	–	X	
20CT6160	X	–	–	–	–	–	–	–	–	–	
20CT6250 vst	X	–	–	X	–	–	X	X	–	–	(RC)
20CT6450 vst	X	X	X	–	–	X	–	–	X	X	(FRC)
1102 tuner UV	411	411	411	411	–	471	411	411	411	411	
1102 tuner ELC	–	–	–	–	ELC	–	–	–	–	–	
1130 SAW filter	–	–	–	–	X	–	–	–	–	–	
1200 PAL B/G	–	–	–	–	–	–	–	–	–	–	
1200 PAL-I	–	–	–	–	–	X	–	–	–	–	
1200 PAL-SECAM	X	X	X	X	X	–	X	X	X	X	
1210 NTSC	X	–	–	–	–	–	–	X	X	–	
1220 rc VST	X	–	–	X	–	–	X	–	–	–	
1220 frc VST	X	–	–	–	–	–	–	–	X	X	
1300 multiV.	X	X	–	–	–	–	X	X	X	X	
1391 fuse 2.5AT	X	X	X	X	X	–	X	X	X	X	
1661 filter ..	5.5	5.5	5.5	5.5	5.5	6.0	5.5	5.5	5.5	5.5	
1662 filter ..	4.5	6.5	–	–	–	–	–	4.5	6.5	–	
1055 mains filter	–	–	–	–	–	–	X	X	–	X	
2112	22n	22n	22n	22n	22n	–	22n	22n	22n	22n	
2114	10p	–	–	–	–	–	–	10p	10p	–	
2115	10p	–	–	–	–	–	–	10p	10p	–	
2155 vst	2u2	2u2	2u2	2u2	–	2u2	2u2	2u2	2u2	2u2	
2330	470u	220u	220u	220u	220u	220u	220u	220u	220u	220u	
2370	220u	220u	–	–	–	–	220u	220u	220u	220u	
2389 frc	220n	220n	220n	–	–	–	–	–	–	220n	
2390	220n	220n	–	–	–	–	220n	220n	220n	220n	
2393	–	–	–	–	–	2n2	–	–	–	–	
2395	–	–	–	–	–	2n2	–	–	–	–	
2396	–	–	–	–	–	2n2	–	–	–	–	
2673	22n	–	–	15n	15n	15n	15n	22n	–	22n	
2673 frc	22n	22n	22n	–	–	22n	–	–	22n	22n	
2674 frc	27n	27n	27n	–	–	27n	–	–	27n	27n	
2675 frc	33u	33u	33u	–	–	33u	–	–	33u	33u	
2676	100n	–	–	100n	100n	100n	100n	100n	–	100n	
2677 frc	2n2	2n2	2n2	–	–	2n2	–	–	2n2	2n2	
2810	120n	–	–	–	–	–	–	120n	120n	–	
2811	560n	680n	680n	680n	680n	680n	680n	560n	560n	680n	
2870	3n3	2n2	2n2	2n2	2n2	2n2	2n2	3n3	3n3	2n2	
3101	22k	–	–	22k	22k	22k	22k	22k	–	22k	
3101 (6160)	20k	–	–	–	–	–	–	–	–	–	
3101 vst	15k	15k	15k	15k	–	15k	15k	15k	15k	15k	
3105 vst	10k	10k	10k	10k	–	10k	10k	10k	10k	10k	
3106 (6160)	6R8	–	–	–	–	–	–	–	–	–	
3108	10R	10R	10R	10R	–	–	10R	10R	10R	10R	
3121	56R	0R	0R	0R	0R	0R	0R	56R	56R	0R	
3122	22R	82R	82R	82R	68R	82R	82R	22R	22R	82R	
3123	3k3	–	–	–	–	–	–	3k3	3k3	–	
3124	10k	–	–	–	–	–	–	10k	10k	–	

Item	/51	/59	/61	/63	/64	/73	/80	/81	/82	/83
3145	–	–	–	–	–	12k	–	–	–	–
3145 vst	12k	12k	12k	12k	–	12k	12k	12k	12k	12k
3362 vst	12k	12k	12k	12k	–	12k	12k	12k	12k	12k
3365 vst	10k	10k	10k	10k	–	10k	10k	10k	10k	10k
3368 vst	56R	56R	56R	56R	–	56R	56R	56R	56R	56R
3393 PTC	X	X	–	–	–	–	X	X	X	X
3566	–	–	–	–	–	680R	–	–	–	–
3585	–	–	–	–	–	–	–	–	–	–
3661 frc	390R	390R	390R	390R	390R	390R	390R	390R	–	390R
3663	1k2	–	–	–	–	–	–	1k2	–	–
3664	1k2	–	–	–	–	–	–	1k2	1k2	–
3665	0R	0R	0R	0R	0R	0R	0R	0R	0R	0R
3665 frc	–	–	–	–	–	24k	–	–	–	–
3666 trimpot	2k2	–	–	2k2	2k2	2k2	2k2	2k2	–	2k2
3666 frc	–	–	–	–	–	–	–	–	–	–
3667 frc	22k	22k	22k	–	–	22k	–	–	22k	22k
3668 frc	22k	22k	22k	–	–	22k	–	–	22k	22k
3673 frc	47k	47k	47k	–	–	47k	–	–	47k	47k
3675	12k	18k	12k	12k	12k	12k	12k	12k	12k	12k
3816	15k	–	–	–	–	–	–	15k	15k	–
3817	2k2	–	–	–	–	–	–	2k2	2k2	–
3870	20k	36k	36k	36k	36k	36k	36k	20k	20k	36k
3873	220k	–	–	–	–	–	–	220k	220k	–
5121 ..uH	.32	–	–	–	–	–	–	.32	.32	–
5672 ..uH	12.5	12.5	–	–	–	–	–	12.5	12.5	–
7675 ..uH	8.4	8.4	8.4	8.4	8.4	6.7	8.4	8.4	8.4	8.4
6102 BA484	X	–	–	–	–	–	–	X	X	–
6392 BY527	X	X	X	X	X	–	X	X	X	X
6392 1N5062	–	–	–	–	–	X	–	–	–	–
6393 1N5062	X	X	–	–	–	X	X	X	X	X
6394 1N5062	X	X	–	–	–	–	X	X	X	X
6395 1N5062	–	–	–	–	–	X	–	–	–	–
6396 1N5062	–	–	–	–	–	X	–	–	–	–
6661 1N4148	X	–	–	–	–	–	–	X	–	–
6662 1N4148	X	–	–	–	–	–	–	X	–	–
6665 frc 1N4148	X	X	X	–	–	X	–	–	X	X
6873 1N4148	X	–	–	–	–	–	–	X	X	–
7368 vst BC548	X	X	X	X	–	X	X	X	X	X
7877 BC548	X	–	–	–	–	–	–	X	X	–
Jumper C pb	cl	–	–	cl	cl	cl	cl	cl	–	cl
Jumper C vst	–	–	–	–	–	–	–	–	–	–
Jumper D	–	–	cl	cl	cl	cl	–	–	–	–
Jumper E pb	cl	–	–	cl	cl	cl	cl	cl	–	cl
Jumper E vst	–	–	–	–	–	–	–	–	–	–
(Cl = closed)										

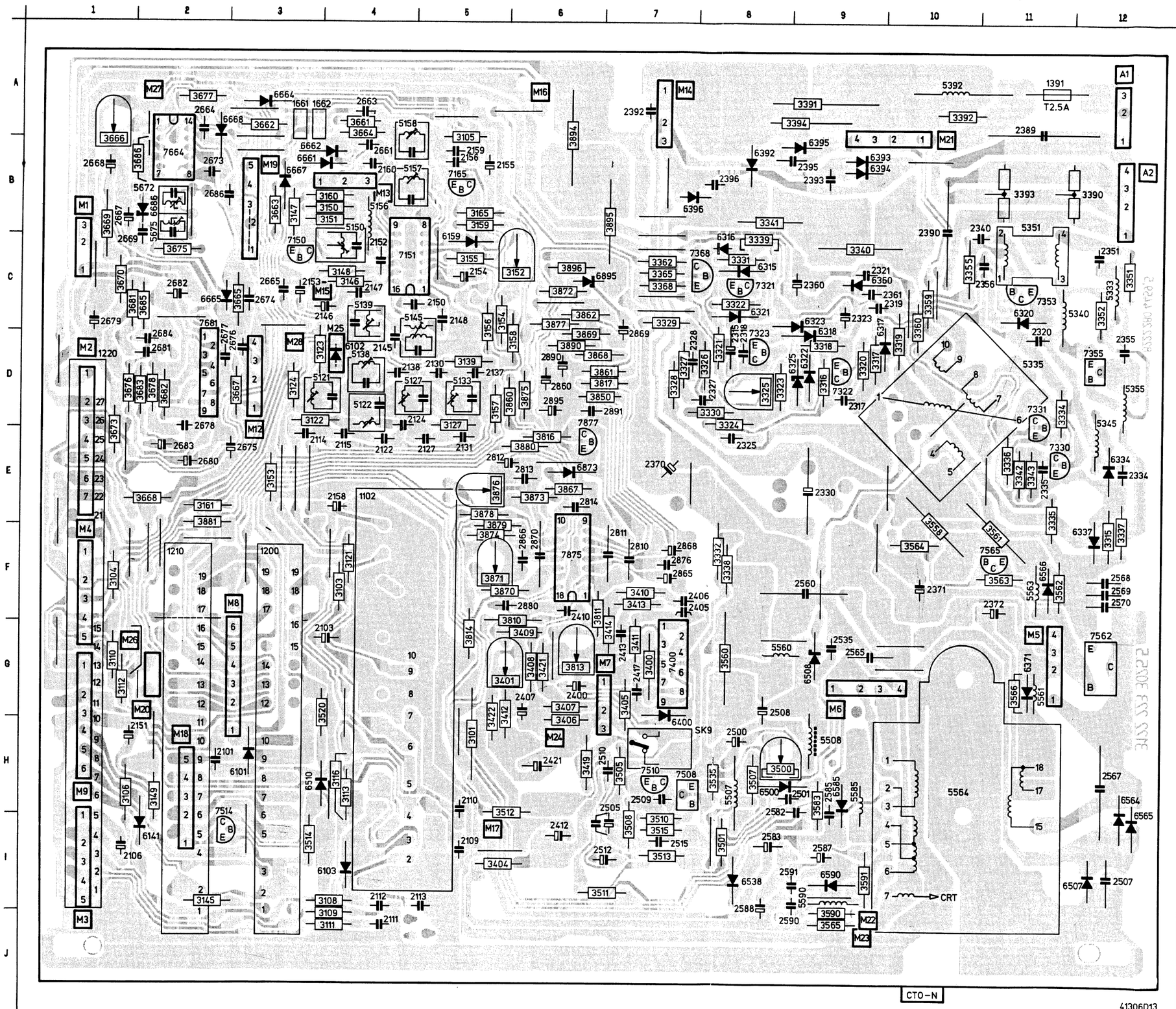
* Items only present when marked with "X"



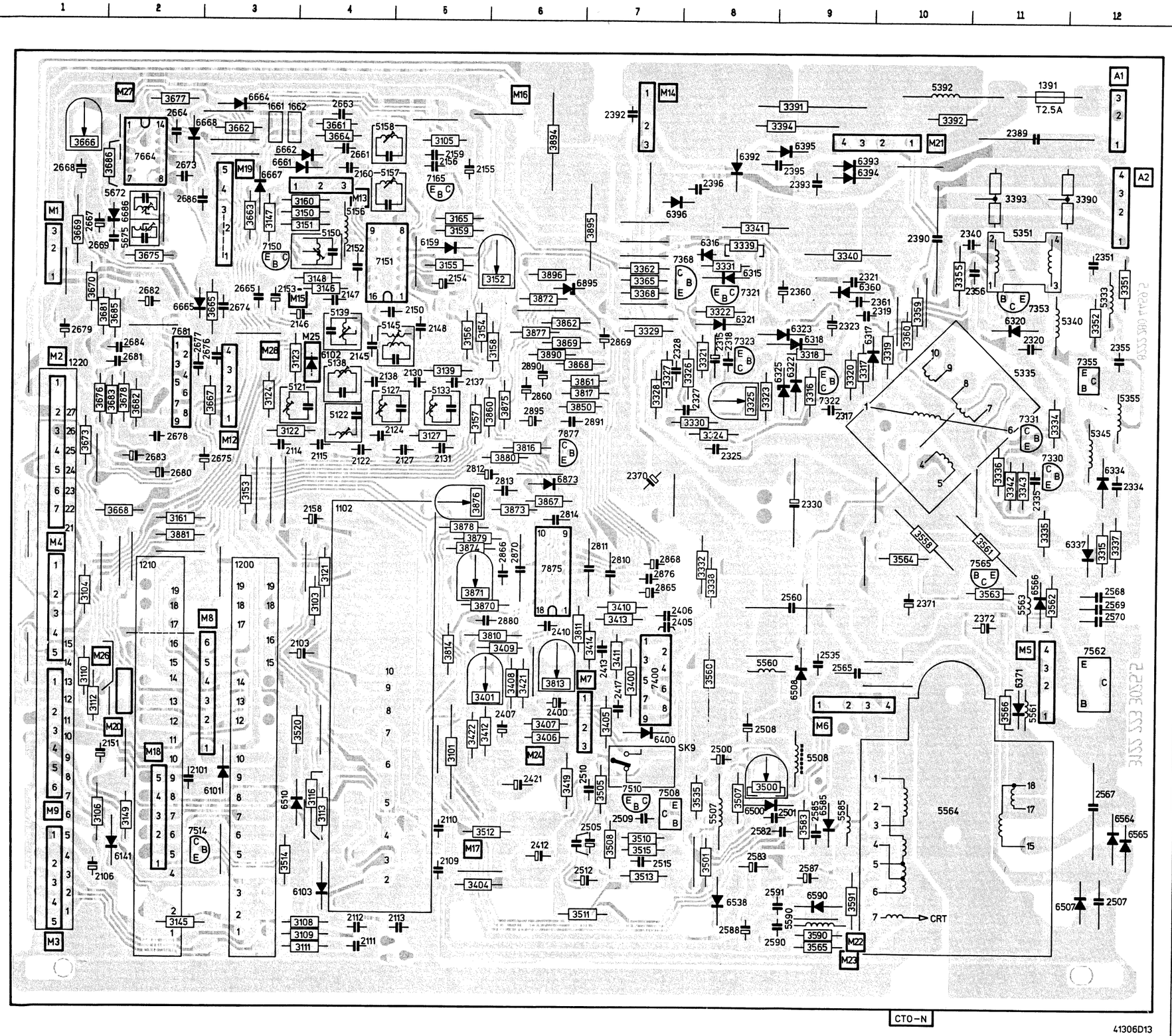
33238 B 13



33239 B 13



1102	E 4	2668	B 1	3394	A 9	5335	D11
1200	F 3	2669	C 1	3400	G 7	5340	C12
1210	F 2	2673	B 2	3401	G 6	5345	D12
1220	D 1	2674	C 3	3404	I 5	5351	B11
1319	A11	2675	E 3	3405	G 7	5355	D12
1661	A 3	2676	D 3	3406	H 6	5392	A10
1662	A 4	2677	C 3	3407	G 6	5507	H 8
2101	H 3	2678	D 2	3408	G 6	5508	H 9
2103	F 4	2679	C 1	3409	G 6	5560	G 9
2106	I 2	2680	E 2	3410	F 7	5561	G11
2109	I 5	2682	C 2	3411	G 7	5563	F11
2110	H 5	2683	E 2	3412	G 5	5564	H10
2111	J 4	2686	B 2	3413	F 7	5585	H 9
2112	I 4	2810	F 7	3414	G 7	5590	I 9
2113	I 5	2811	F 7	3419	H 6	5672	B 2
2114	E 4	2812	E 5	3421	G 6	5675	B 2
2115	E 4	2813	E 6	3422	G 5	6101	H 3
2122	E 4	2814	E 6	3500	H 8	6102	D 4
2124	D 5	2860	D 6	3501	I 8	G103	I 4
2127	E 5	2865	F 7	3505	H 7	6141	I 2
2130	D 5	2866	F 6	3507	H 8	6159	C 5
2131	E 5	2868	F 7	3508	I 7	6315	C 8
2137	D 5	2870	F 6	3510	I 7	6316	C 8
2138	D 5	2876	F 7	3511	I 7	6317	C10
2145	D 4	2880	F 6	3512	H 6	6318	C 9
2146	C 4	2890	D 6	3513	I 7	6320	C11
2147	C 4	2891	D 7	3514	I 3	6321	C 8
2148	C 5	2895	D 6	3515	I 7	6322	D 9
2150	C 5	3101	H 5	3520	G 4	6323	C 9
2151	H 2	3103	F 4	3535	H 8	6325	D 9
2152	C 4	3104	F 1	3558	E10	6334	E12
2153	C 3	3105	A 5	3560	G 8	6337	E12
2154	C 5	3106	H 2	3561	F11	6360	C10
2155	B 6	3108	I 4	3562	F11	6371	G11
2156	B 5	3109	J 4	3563	F11	6392	B 8
2158	E 4	3110	G 1	3564	F10	6393	B 9
2159	B 5	3111	J 4	3565	J 9	6394	B 9
2160	B 4	3112	G 1	3566	G11	6395	B 9
2315	C 8	3113	H 4	3583	H 9	6396	B 8
2317	D 9	3116	H 4	3590	I 9	6400	H 7
2318	C 8	3121	F 4	3591	I 9	6500	H 8
2319	C10	3122	D 3	3661	A 4	6507	I12
2320	C11	3123	D 4	3662	A 3	6508	G 9
2321	C10	3124	D 3	3663	B 3	6510	H 3
2323	C 9	3127	D 5	3664	A 4	6538	I 8
2325	E 8	3139	D 5	3665	C 3	6564	H12
2327	D 8	3145	I 2	3666	B 1	6565	H12
2328	D 8	3146	C 4	3667	D 3	6566	F11
2330	E 9	3147	B 3	3668	E 2	6585	H 9
2334	E12	3148	C 4	3669	B 1	6590	I 9
2335	E11	3149	H 2	3670	C 1	6661	B 3
2340	B11	3150	C 6	3673	E 1	6662	B 3
2351	C12	3150	B 4	3675	C 2	6664	A 3
2355	D12	3151	B 4	3676	D 2	6665	C 2
2356	C11	3153	E 3	3677	A 2	6667	B 3
2360	C 9	3154	C 5	3678	D 2	6668	A 3
2361	C10	3155	C 5	3681	C 2	6686	B 2
2370	E 7	3156	C 5	3682	D 2	6873	E 6
2371	F10	3157	D 5	3683	D 2	6895	C 7
2372	F11	3158	D 6	3685	C 2	7150	C 3
2389	A11	3159	B 5	3686	B 2	7151	C 4
2390	B10	3160	B 4	3810	F 6	7165	B 5
2392	A 7	3161	E 2	3811	F 7	7321	C 8
2393	B 9	3165	B 5	3813	G 6	7322	D 9
2395	B 9	3315	F12	3814	G 5	7323	D 8
2396	B 8	3317	D10	3816	E 6	7330	E11
2400	G 6	3318	D 9	3817	D 7	7331	D11
2405	F 8	3319	D10	3850	D 6	7353	C11
2406	F 8	3320	D 9	3860	D 6	7355	D12
2407	G 6	3321	D 8	3861	D 7	7368	C 8
2410	F 6	3322	C 8	3862	C 6	7400	G 7
2412	I 6	3323	D 9	3864	J12	7508	H 7
2413	G 7	3324	D 8	3867	E 6	7510	H 7
2417	G 7	3325	D 8	3868	D 6	7514	I 3
2421	H 6	3326	D 8	3869	D 6	7562	G12
2500	H 8	3327	D 7	3870	F 6	7565	F11
2501	H 9	3328	D 7	3871	F 5	7664	B 2
2505	H 7	3329	C 7	3872	C 6	7681	C 2
2507	I12	3330	D 8	3873	E 6	7875	F 6
2508	G 8	3331	C 8	3874	F 5	7877	D 6
2509	H 7	3332	F 8	3875	D 6	SK 9	H 8
2510	H 7	3334	D11	3876	E 5		
2512	I 7	3335	E11	3877	C 6		
2515	I 7	3336	E11	3878	E 5		
2535	G 9	3337	E12	3879	E 5		
2560	F 9	3338	F 8	3880	E 6		
2565	G 9	3339	C 8	3881	E 2		
2567	H12	3340	C 9	3890	D 6		
2568	F12	3341	B 8	3894	A 6		
2569	F12	3342	E11	3895	B 7		
2570	F12	3343	E11	3896	C 6		
2582	H 8	3351	C12	5121	D 4		
2583	I 8	3352	C12	5122	D 4		
2585	H 9	3355	C10	5127	D 5		
2587	I 9	3359	C10	5133	D 5		
2588	I 8	3360	C10	5138	D 4		
2590	J 9	3362	C 7	5139	C 4		
2591	I 9	3365	C 7	5145	C 5		
2661	B 4	3368	C 7	5150	B 4		
2663	A 4	3390	B12	5156	B 4		
2664	A 2	3391	A 9	5157	B 5		
2665	C 3	3392	A10	5158	A 4		
2667	B 1	3393	B11	5333	C12		



	1102	E 4	2668	B 1	3394	A 9	5335	D11			
	1200	F 3	2669	C 1	3400	G 7	5340	C12			
	1210	F 2	2673	B 2	3401	G 6	5345	D12			
	1220	D 1	2674	C 3	3404	I 5	5351	B11			
	1319	A11	2675	E 3	3405	G 7	5355	D12			
	1661	A 3	2676	D 3	3406	H 6	5392	A10			
A	1662	A 4	2677	C 3	3407	G 6	5507	H 8			
	2101	H 3	2678	D 2	3408	G 6	5508	H 9			
	2103	F 4	2679	C 1	3409	G 6	5560	G 9			
	2106	I 2	2680	E 2	3410	F 7	5561	G11			
	2109	I 5	2682	C 2	3411	G 7	5563	F11			
	2110	H 5	2683	E 2	3412	G 6	5564	H10			
	2111	J 4	2686	B 2	3413	F 7	5585	H 9			
	2112	I 4	2810	F 7	3414	G 7	5590	I 9			
	2113	I 5	2811	F 7	3419	H 6	5672	B 2			
	2114	E 4	2812	E 5	3421	G 6	5675	B 2			
B	2115	E 4	2813	E 6	3422	G 5	6101	H 3			
	2122	E 4	2814	E 6	3500	H 8	6102	D 4			
	2124	D 5	2860	D 6	3501	I 8	6103	I 4			
	2127	E 5	2865	F 7	3505	H 7	6141	I 2			
	2130	D 5	2866	F 6	3507	H 8	6159	C 5			
	2131	E 5	2868	F 7	3508	I 7	6315	C 8			
	2137	D 5	2870	F 6	3510	I 7	6316	C 8			
	2138	D 5	2876	F 7	3511	I 7	6317	C10			
	2145	D 4	2880	F 6	3512	H 6	6318	C 9			
	2146	C 4	2890	D 6	3513	I 7	6320	C11			
C	2147	C 4	2891	D 7	3514	I 3	6321	C 8			
	2148	C 5	2895	D 6	3515	I 7	6322	D 9			
	2150	C 5	3101	H 5	3520	G 4	6323	C 9			
	2151	H 2	3103	F 4	3535	H 8	6325	D 9			
	2152	C 4	3104	F 1	3558	E10	6334	E12			
	2153	C 3	3105	A 5	3560	G 8	6337	E12			
	2154	C 5	3106	H 2	3561	F11	6360	C10			
	2155	B 6	3108	I 4	3562	F11	6371	G11			
	2156	B 5	3109	J 4	3563	F11	6392	B 8			
	2158	E 4	3110	G 1	3564	F10	6393	B 9			
D	2159	B 5	3111	J 4	3565	J 9	6394	B 9			
	2160	B 4	3112	G 1	3566	G11	6395	B 9			
	2315	C 8	3113	H 4	3583	H 9	6396	B 8			
	2317	D 9	3116	H 4	3590	I 9	6400	H 7			
	2318	C 8	3121	F 4	3591	I 9	6500	H 8			
	2319	C10	3122	D 3	3661	A 4	6507	I12			
	2320	C11	3123	D 4	3662	A 3	6508	G 9			
	2321	C10	3124	D 3	3663	B 3	6510	H 3			
	2323	C 9	3127	D 5	3664	A 4	6538	I 8			
	2325	E 8	3139	D 5	3665	C 3	6564	H12			
E	2327	D 8	3145	I 2	3666	B 1	6565	H12			
	2328	D 8	3146	C 4	3667	D 3	6566	F11			
	2330	E 9	3147	B 3	3668	E 2	6585	H 9			
	2334	E12	3148	C 4	3669	B 1	6590	I 9			
	2335	E11	3149	H 2	3670	C 1	6661	B 3			
	2340	B11	3150	C 6	3673	E 1	6662	B 3			
	2351	C12	3150	B 4	3675	C 2	6664	A 3			
	2355	D12	3151	B 4	3676	D 2	6665	C 2			
	2356	C11	3153	E 3	3677	A 2	6667	B 3			
	2360	C 9	3154	C 5	3678	D 2	6668	A 3			
F	2361	C10	3155	C 5	3681	C 2	6686	B 2			
	2370	E 7	3156	C 5	3682	D 2	6873	E 6			
	2371	F10	3157	D 5	3683	D 2	6895	C 7			
	2372	F11	3158	D 6	3685	C 2	7150	C 3			
	2389	A11	3159	B 5	3686	B 2	7151	C 4			
	2390	B10	3160	B 4	3810	F 6	7165	B 5			
	2392	A 7	3161	E 2	3811	F 7	7321	C 8			
	2393	B 9	3165	B 5	3813	G 6	7322	D 9			
	2395	B 9	3315	F12	3814	G 5	7323	D 8			
	2396	B 8	3317	D10	3816	E 6	7330	E11			
G	2400	G 6	3318	D 9	3817	D 7	7331	D11			
	2405	F 8	3319	D10	3850	D 6	7353	C11			
	2406	F 8	3320	D 9	3860	D 6	7355	D12			
	2407	G 6	3321	D 8	3861	D 7	7368	C 8			
	2410	F 6	3322	C 8	3862	C 6	7400	G 7			
	2412	I 6	3323	D 9	3864	J12	7508	H 7			
	2413	G 7	3324	D 8	3867	E 6	7510	H 7			
	2417	G 7	3325	D 8	3868	D 6	7514	I 3			
	2421	H 6	3326	D 8	3869	D 6	7562	G12			
	2500	H 8	3327	D 7	3870	F 6	7565	F11			
H	2501	H 9	3328	D 7	3871	F 5	7664	B 2			
	2505	H 7	3329	C 7	3872	C 6	7681	C 2			
	2507	I12	3330	D 8	3873	E 6	7875	F 6			
	2508	G 8	3331	C 8	3874	F 5	7877	D 6			
	2509	H 7	3332	F 8	3875	D 6	SK 9	H 8			
	2510	H 7	3334	D11	3876	E 5					
	2512	I 7	3335	E11	3877	C 6					
	2515	I 7	3336	E11	3878	E 5					
	2535	G 9	3337	E12	3879	E 5					
	2560	F 9	3338	F 8	3880	E 6					
I	2565	G 9	3339	C 8	3881	E 2					
	2567	H12	3340	C 9	3890	D 6					
	2568	F12	3341	B 8	3894	A 6					
	2569	F12	3342	E11	3895	B 7					
	2570	F12	3343	E11	3896	C 6					
	2582	H 8	3351	C12	5121	D 4					
	2583	I 8	3352	C12	5122	D 4					
	2585	H 9	3355	C10	5127	D 5					
	2587	I 9	3359	C10	5133	D 5					
	2588	I 8	3360	C10	5138	D 4					
J	2590	J 9	3362	C 7	5139	C 4					
	2591	I 9	3365	C 7	5145	C 5					
	2661	B 4	3368	C 7	5150	B 4					
	2663	A 4	3390	B12	5156	B 4					
	2664	A 2	3391	A 9	5157	B 5					
	2665	C 3	3392	A10	5158	A 4					
	2667	B 1	3393	B11	5333	C12					

DIAGRAM A

CHANNEL SELECTOR

SYNCHRONISATION

HORIZONTAL

TXT INTERFACE

1210 NTSC PANEL

1200 PAL OR PAL/SECAM PA

1220 VST-PANEL

1080

C+B

THIS VOLTAGE DETECTION CIRCUIT ONLY PRESENT IN CASE OF MULTIVOLTAGE SETS

DEGAUSSING COILS

2) ONLY IN CASE OF MULTI VOLTAGE SETS

IN CASE OF MULTIVOLTAGE SETS BRIDGE OPEN

1210 NTSC PANEL

1200 PAL OR PAL/SECAM PANEL

1040 R-G-B AMPLIFIER

SEE SERVICE MANUAL . REMARKS

HORIZONTAL

EAST-WEST

VERTICAL

SOUND DEMODULATOR

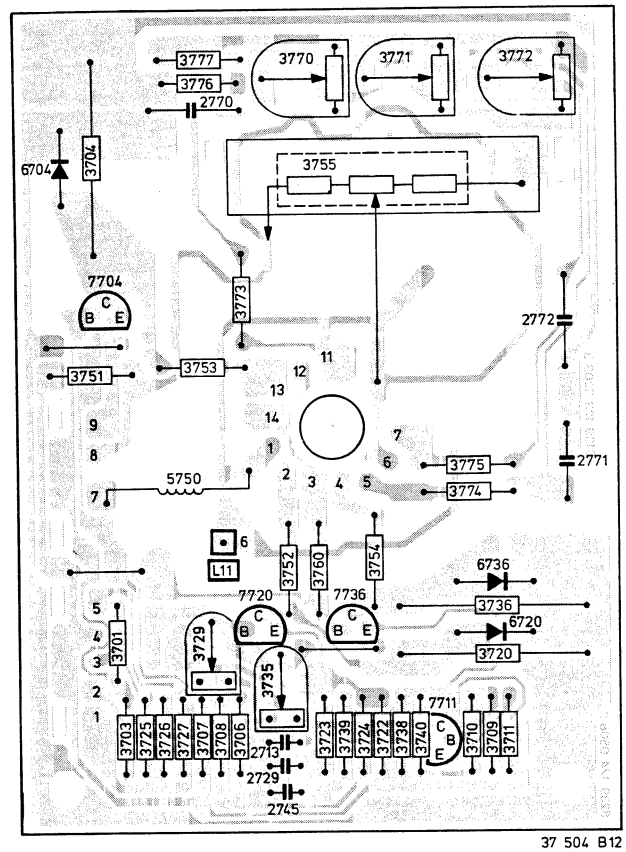
1) FOR REMARKS SEE SERVICE MANUAL

CTO-N 20" DAS

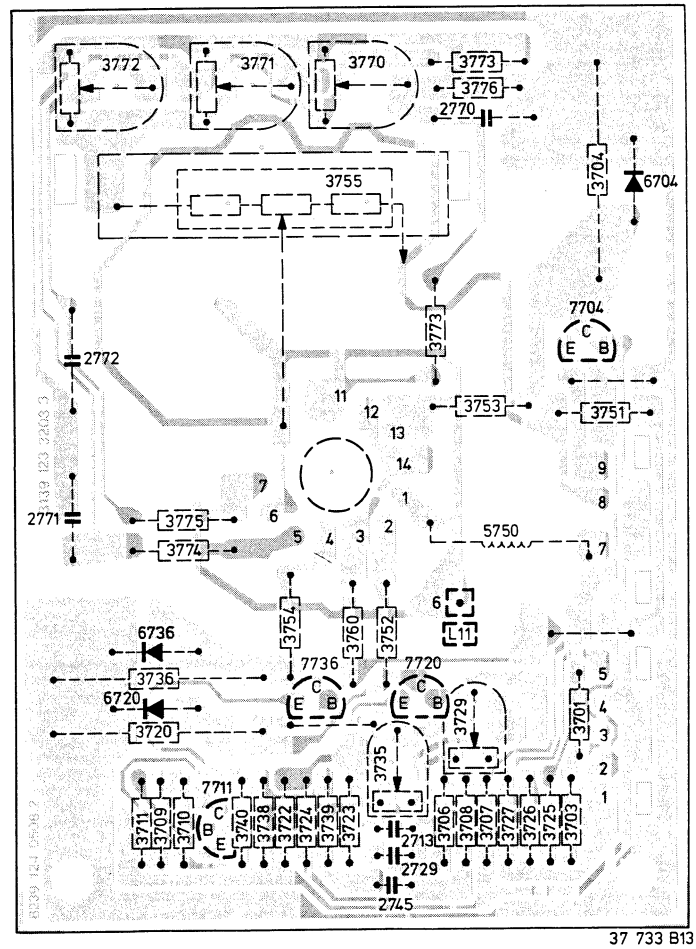
PRS.01756
T02/651

CS 6 404

1001	N 3	3011	F 2	3759	C33		
1002	M 3	3014	O 9	3760	C32		
1009	M 7	3019	N 9	3810	K10		
1010	B34	3101	E 5	3811	K11		
1020	G33	3103	A 3	3813	L10		
1040	A28	3104	E 6	3814	J27		
1051	A 2	3105	E14	3816	K 9		
1080	L10	3106	J27	3817	K 9		
1102	B 2	3108	E 2	3860	I 9		
1200	A22	3109	E 2	3862	G 9		
1210	A18	3110	E 4	3868	G10		
1220	M15	3111	E 3	3869	F10		
1661	M24	3112	D 6	3870	G11		
1662	N24	3113	D 3	3871	F11		
2001	M 4	3121	B 4	3872	G 8		
2002	O 3	3122	B 5	3873	J11		
2004	O 6	3123	C 7	3874	K12		
2008	O 6	3124	D 7	3875	I 8		
2008	K 4	3127	B 7	3876	K13		
2101	E 5	3139	B 9	3877	J 8		
2103	B 3	3145	M18	3878	K14		
2106	J28	3146	C 9	3879	I 9		
2109	D 3	3147	B16	3880	I 8		
2110	D 4	3148	C16	3890	F11		
2111	E 3	3149	J27	3894	N13		
2112	D 1	3150	B15	3895	M12		
2113	D 2	3151	B16	3896	M12		
2114	B 5	3152	E12	5001	L11		
2115	B 5	3153	D11	5070	O 2		
2122	B 5	3154	E11	5071	N 2		
2124	B 6	3155	E14	5097	H25		
2127	B 7	3156	D10	5121	B 5		
2130	B 8	3157	D10	5122	A 6		
2131	B 7	3158	E10	5127	C 7		
2137	B 8	3159	D12	5133	A 8		
2138	B 8	3160	C15	5138	C 9		
2145	B 9	3161	D12	5139	A 9		
2146	D 9	3165	E12	5145	B 9		
2147	C 9	3316	H14	5150	A15		
2148	C10	3317	I15	5156	C14		
2150	A10	3318	I15	5157	A12		
2151	K28	3319	F16	5158	A13		
2152	E12	3320	K14	5333	G18		
2153	E10	3321	J16	5335	F21		
2154	E11	3322	I17	5340	F19		
2155	E14	3323	J17	5345	H20		
2156	E15	3324	I17	5351	G16		
2158	E 9	3325	J17	5355	F18		
2159	D13	3326	K17	5507	H26		
2160	C15	3327	K18	5508	H26		
2315	I17	3328	K18	5561	I 23		
2317	I14	3329	K17	5563	G22		
2318	J16	3330	I18	5564	F24		
2319	J15	3331	H18	5585	J25		
2320	H17	3332	H19	5590	I 25		
2321	H18	3334	I19	5672	O26		
2323	I18	3335	K19	5675	O27		
2325	I18	3336	I19	5750	C32		
2327	J18	3337	K20	5751	C32		
2328	K18	3338	H18	6001	N 5		
2330	O13	3339	I16	6002	M 5		
2334	H20	3340	G16	6007	O 5		
2335	K19	3341	F16	6008	O 7		
2340	H16	3342	K19	6009	F 7		
2351	G17	3343	K19	6010	F 3		
2355	F19	3351	G17	6012	N 7		
2356	G15	3352	G19	6012	G 6		
2371	I22	3355	G16	6013	F 5		
2392	O12	3362	G14	6013	O 8		
2393	N12	3365	H14	6101	E 4		
2395	O12	3368	H15	6102	C 5		
2396	N12	3400	G31	6141	C22		
2400	G31	3401	K32	6159	D13		
2405	I31	3404	I26	6315	I17		
2407	K32	3405	H33	6316	H18		
2410	K31	3406	J33	6317	K14		
2412	I26	3407	J33	6318	K16		
2413	H29	3408	J32	6320	G15		
2421	J33	3409	K32	6321	I16		
2500	L27	3410	I30	6322	K15		
2501	L26	3411	I32	6323	I19		
2505	K30	3412	J32	6325	I20		
2507	H24	3413	I29	6334	H20		
2508	I26	3414	J29	6337	K20		
2509	H28	3419	G33	6392	O12		
2510	G28	3421	K33	6393	N11		
2512	H28	3500	L27	6395	O11		
2515	G28	3501	L28	6396	N12		
2560	H25	3505	K31	6400	G32		
2565	G26	3507	H26	6500	K26		
2567	H24	3508	I28	6507	H23		
2568	G23	3510	H27	6510	G26		
2569	G23	3511	G28	6564	H23		
2570	G24	3512	G27	6566	H22		
2582	K26	3513	H28	6583	K26		
2583	K27	3514	F26	6585	J26		
2585	J26	3515	H27	6590	I 25		
2587	J27	3520	G26	6661	M23		
2588	I26	3535	I27	6662	N23		
2590	I25	3558	G21	6664	M27		
2661	M23	3561	G21	6667	N24		
2663	O24	3562	H22	6668	M24		
2664	O25	3563	H22	6705	D30		
2665	O29	3564	I21	6721	C30		
2667	N27	3565	H26	6737	A30		
2668	M28	3583	K24	6873	J11		
2669	M28	3590	I24	6895	M13		
2673	N28	3661	M23	7001	K 5		
2674	N29	3662	N25	7003	K 4		
2713	E31	3663	M23	7007	O 5		
2729	C31	3664	N23	7009	N 7		
2745	B31	3669	M28	7010	G 4		
2753	C33	3670	M28	7012	G 6		
2810	K10	3675	O27	7150	B16		
2811	K10	3701	D29	7151	B14		
2812	J28	3703	D29	7165	E12		
2813	J28	3704	D30	7321	I16		
2814	G13	3705	E29	7322	K15		
2860	F11	3706	E30	7323	J16		
2865	J 9	3707	E30	7330	J19		
2866	K12	3708	E30	7331	J19		
2868	F10	3709	A28	7353	H16		
2869	F 9	3710	B28	7355	G19		
2870	F11	3711	A29	7368	H15		
2876	H 9	3720	B30	7400	G32		
2880	H 9	3721	C29	7508	H27		
2890	F11	3722	C30	7510	I 28		
2891	F10	3723	C30	7514	F26		
2895	L13	3724	D30	7562	G23		
3001	N 2	3725	E29	7565	H22		
3001	N 3	3726	C28	7664	N26		
3001	K 6	3727	D28	7704	D30		
3002	O 3	3729	D29	7711	A28		
3002	K 6	3735	C28	7720	C30		
3003	K 5	3736	A30	7736	A30		
3004	N 5	3737	B29	7875	G13		
3004	K 4	3738	B30	7877	J 9		
3005	O 5	3739	B30	SK9	F33		
3005	L 4	3740	B30				
3006	K 4	3751	C33				
3007	O 5	3752	C30				
3008	N 6	3753	D30				
3008	J 4	3754	A30				
3010	N 6	3755	D32				
3010	G 4	3756	D33				
3011	M 6	3758	D32				



37 504 B12



37 733 B13

DIFFERENCE LIST FOR 20" DAS SETS

Item	/51	/73	/81
20CT6550	X	X	X
20CT6850		X	
1102 tuner UV..	411	471	411
1200 PAL	–	PAL-I	–
1200 PAL/SECAM	X	–	X
1210 NTSC	X	–	X
1210 TXT interf. (6850 only)	–	X	–
1220 VST	X	X	X
1230 TXT supply (6850 only)	–	X	–
1300 Multi volt.	–	–	–
1661 filter ..MHz	5.5	6.0	5.5
1662 filter ..MHz	4.5	–	4.5
2112	22n	–	22n
2114	10p	–	10p
2115	10p	–	10p
2137	2p2	12p	2p2
2810	120n	–	120n
2811	560n	680n	560n
2870	3n3	2n2	3n3
3108	10R	–	10R
3121	56R	0R	56R
3122	22R	82R	22R
3123	3k3	–	3k3
3124	10k	–	10k
3663	1k2	–	1k2
3664	1k2	–	1k2
3816	15k	–	15k
3817	2k2	–	2k2
3870	20k	36k	20k
3873	220k	–	220k
3879	6k8	6k8	6k8
3879 (6850)	–	–	–
3881	–	–	–
3881 (6850)	–	0R	–
5121 ..uH	0.32	–	0.32
5672 ..uH	12.5	–	12.5
5675 ..uH	8.4	6.7	8.4
6102 BA484	X	–	X
6661 1N4148	X	–	X
6662 1N4148	X	–	X
6873 1N4148	X	–	X
7877 BC548	X	–	X
Jumper C	–	–	–
Jumper D	cl	cl	cl
Jumper E (cl = closed)	–	–	–

* Items only present when marked with "X"

DIAGRAM A

CHANNEL SELECTOR

1210 NTSC PANEL

1200 PAL OR PAL/SECAM PANEL

SUPPLY

1055 160V ADAPTER

AUTOMATIC MULTIVOLTAGE 1) ADAPTER PANEL WITHOUT MAINS SEPARATION

SYNCHRONISATION

HORIZONTAL

1220 VST-PANEL

SOUND DEMODULATOR

CHANNEL SELECTOR 1) FOR ELC

MAINSFILTER 1055

OR 26"

1) 1210 NTSC PANEL

1) 1200 PAL OR PAL/SECAM PANEL

1040 R-G-B AMPLIFIER

HORIZONTAL

EAST-WEST

VERTICAL

SOUND DEMODULATOR

1) FOR REMARKS SEE SERVICE MANUAL

CTO-N 26"

PRS 01878
T32/703

	1001	M 9		2810	J10		3561	G21		6325	H20				
	1010	B32		2811	K10		3562	H22		6334	H20				
	1020	G33		2812	I 28		3563	H22		6337	K20				
	1040	µ25		2813	I 28		3564	I 22		6360	F22				
	1050	I 7		2814	G13		3565	H26		6392	G 5				
	1051	A 2		2860	F11		3565	I 26		6392	N 3				
A	1051	M 5		2865	J 9		3583	K24		6393	H 6				
	1055	F 5		2866	K12		3590	I 25		6393	O 2				
	1102	B 2		2868	F10		3661	M21		6394	H 7				
	1200	A22		2869	F10		3662	N23		6395	N 2				
	1210	A18		2870	F12		3663	M21		6396	O 3				
	1220	M12		2876	G 9		3664	N21		6400	G32				
	1371	I 24		2880	H 9		3666	M25		6500	K26				
	1391	G 4		2890	F11		3667	M26		6507	H23				
	1661	M22		2891	F11		3668	M27		6510	G26				
B	1662	N21		2895	H 7		3669	M25		6564	H23				
	2001	N10		3001	F 2		3670	M33		6565	H23				
	2004	F 6		3001	F 5		3673	L27		6566	G22				
	2006	O 9		3002	G 6		3675	O25		6583	K26				
	2101	E 5		3002	N11		3676	M31		6585	J26				
	2103	A 3		3003	N10		3677	O23		6590	I 26				
	2106	J28		3004	F 6		3678	O29		6661	M21				
	2109	D 3		3005	N10		3678	O32		6662	N21				
	2110	D 4		3006	O 9		3681	N30		6664	L24				
C	2111	D 3		3101	D 5		3682	O32		6665	M26				
	2112	D 2		3103	A 3		3683	O28		6667	M22				
	2113	D 2		3104	E 6		3683	O31		6668	M22				
	2114	B 5		3105	E15		3685	O32		6704	D29				
	2115	B 5		3106	J27		3701	D26		6720	C29				
	2122	B 6		3108	D 2		3703	D26		6736	A29				
	2124	A 7		3109	D 2		3704	D28		6873	J11				
	2127	B 7		3110	E 4		3706	E28		6895	H 6				
	2130	A 8		3111	D 3		3707	E27		7150	A16				
	2131	B 8		3112	D 6		3708	E28		7151	B14				
D	2137	B 8		3113	D 3		3709	A26		7165	E13				
	2138	B 9		3121	A 5		3710	B26		7301	J 4				
	2145	B 9		3122	A 5		3711	A26		7302	K 5				
	2146	D 9		3123	C 7		3720	D26		7303	K 3				
	2147	C10		3124	D 7		3722	C27		7321	I 16				
	2148	B10		3127	A 7		3723	C28		7322	K15				
	2150	A11		3139	B 9		3724	C28		7323	J16				
	2151	J28		3145	L16		3725	E26		7330	J19				
	2152	D12		3146	C 9		3726	C26		7331	J19				
E	2153	E11		3147	B16		3727	D26		7353	H17				
	2154	E11		3148	B16		3729	D26		7355	F19				
	2155	E15		3149	J27		3735	C26		7368	G15				
	2156	E15		3150	B15		3736	A27		7400	G32				
	2158	E10		3151	B16		3738	B27		7508	H27				
	2159	D13		3152	E12		3739	B28		7510	I 28				
	2160	C15		3153	D11		3740	B28		7514	F27				
	2301	I 2		3154	E11		3751	C30		7562	G22				
	2302	K 2		3155	E14		3752	B28		7565	H22				
	2303	K 4		3156	D10		3753	D28		7664	N24				
F	2304	J 5		3157	D10		3754	A28		7681	N29				
	2305	K 6		3158	E10		3755	D30		7681	N32				
	2306	K 6		3158	D12		3760	A30		7704	D27				
	2307	K 7		3160	C16		3770	C31		7711	A26				
	2315	I 17		3161	D12		3771	C31		7720	B27				
	2317	H14		3165	E13		3772	C32		7736	A27				
	2318	J17		3301	J 2		3773	C31		7875	G13				
	2319	J15		3302	K 2		3774	C31		7677	J 9				
	2320	H17		3303	K 4		3775	C31		SK1	H 3				
G	2321	H18		3304	J 5		3776	D32		SK9	F33				
	2323	H18		3305	J 6		3777	C30							
	2325	I 18		3306	J 6		3810	K10							
	2327	J18		3307	J 3		3811	K11							
	2328	K18		3308	K 3		3813	K10							
	2330	H 6		3309	J 6		3814	J27							
	2334	H20		3310	J 3		3816	K 9							
	2335	K19		3311	J 4		3817	K 9							
	2340	G16		3312	K 4		3860	I 9							
	2351	G17		3313	K 3		3862	F 9							
H	2355	F19		3314	K 6		3867	K13							
	2356	G15		3315	K 6		3868	G10							
	2360	F22		3315	K20		3869	F10							
	2361	F22		3316	J 7		3870	F12							
	2370	H 5		3316	H14		3871	F12							
	2371	I 22		3317	H15		3872	G 8							
	2372	I 22		3318	H15		3873	J11							
	2389	G 4		3319	F15		3874	K12							
	2390	F 3		3320	K14		3875	I 9							
	2392	G 5		3321	J16		3876	K13							
	2392	N 3		3322	I16		3877	J 9							
	2393	O 2		3323	J18		3878	K14							
	2395	N 2		3324	I18		3879	I 9							
	2396	O 3		3325	J17		3880	I 9							
	2400	G31		3326	K18		3890	F11							
	2405	I 32		3327	K18		3894	G 6							
	2406	J31		3328	K18		3895	G 6							
	2407	K32		3329	K18		3896	G 7							
	2410	K31		3330	J18		5001	N10							
	2412	I 27		3331	I17		5002	N11							
	2413	H29		3332	I17		5097	G25							
	2417	G30		3334	H19		5098	F 2							
	2421	J34		3335	K19		5121	B 5							
	2500	L27		3336	I19		5122	A 6							
	2501	L26		3337	K19		5127	B 8							
	2505	K30		3338	I17		5133	A 8							
	2507	H24		3339	H16		5138	C 9							
	2508	H26		3340	F17		5139	A 9							
	2509	H28		3341	F17		5145	B 9							
	2510	G28		3342	K19		5150	A15							
	2512	H28		3343	K19		5156	C14							
	2515	G28		3351	F17		5157	A12							
	2560	H25		3352	G19		5158	A13							
	2565	G26		3355	G16		5333	G18							
	2567	G24		3359	F20		5335	F21							
	2568	G24		3360	F21		5340	F19							
	2582	K26		3362	G14		5345	G20							
	2583	K27		3365	G14		5351	G17							
	2585	J26		3368	G15		5355	F18							
	2587	J27		3390	F 3		5392	G 4							
	2588	I 26		3392	G 4		5507	H26							
	2589	I 28		3393	F 4		5508	H26							
	2591	H26		3400	G31		5560	H25							
	2661	M21		3401	K33		5563	G22							
	2663	O22		3404	I 26		5564	F24							
	2664	O23		3405	H33		5585	J25							
	2665	O27		3406	J33		5590	F25							
	2667	M25		3407	J33		5672	O23							
	2668	M26		3408	J32		5675	O25							
	2669	M25		3409	K32		5750	D29							
	2670	M32		3410	I 30		6001	I 23							
	2673	N26		3411	I 33		6002	F 6							
	2674	N26		3412	J33		6002	I 23							
	2675	M27		3413	I 29		6005	O10							
	2676	N27		3414	J30		6101	E 4							
	2677	N28		3419	G34		6102	C 5							
	2678	O29		3421	K34		6103	O 6							
	2678	O31		3422	K33		6159	D13							
	2679	M33		3500	L27		6301	J 3							
	2680	M32		3501	K28		6302	I 3							
	2680	O30		3505	K31		6303	K 2							
	2682	N33		3508	H28		6304	K 3							
	2683	N28		3510	H28		6305	K 7							
	2683	N31		3511	G28		6306	K 7							
	2684	O31		3512	G28		6315	H16							
	2713	E29		3513	H28		6316	H17							
	2729	C29		3514	F27		6317	K14							
	2745	B29		3515	H28		6318	K16							
	2770	D30		3520	G26		6320	G15							
	2771	D31		3535	H27		6321	I 16							
	2772	D31		3558	G21		6322	K15							
				3560	H25		6323	H19							

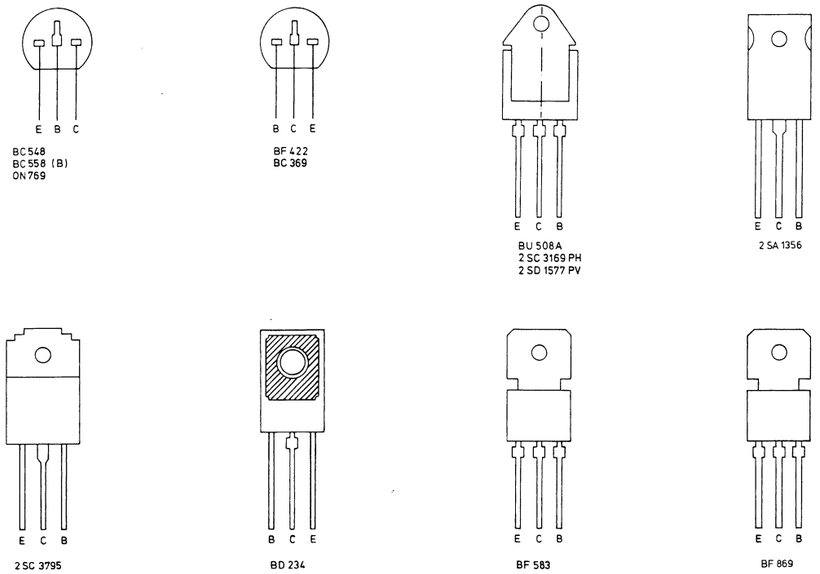
DIFFERENCE LIST FOR 26" SETS

Item	/51	/62	/64	/73	/80
26CT6070	X	–	X	X	X
26CT6470	X	X	–	X	X
1102 tuner UV..	411	–	–	471	411
1102 tuner ELC	–	X	X	–	–
1103 SAW filter	–	–	X	–	–
1200 PAL-I	–	–	–	X	–
1200 PAL SECAM	X	X	X	–	X
1210 NTSC	X	–	–	–	–
1220 vst panel	X	X	–	X	X
1050 multi volt.	X	–	–	–	X
1661 filter ..MHz	5.5	5.5	5.5	6.0	5.5
1662 filter ..MHz	4.5	–	–	–	–
1681 pb assy 4W	X	–	X	X	X
1681 vst assy 10W	X	X	–	X	X
1055 mains filter	–	–	–	X	–
2109	4n7	–	–	4n7	4n7
2112	22n	22n	22n	–	22n
2114	10p	–	–	–	–
2115	10p	–	–	–	–
2124	5p6	6p8	–	5p6	5p6
2137	2p2	3p3	–	12p	2p2
2145	6p8	4p7	–	6p8	6p8
2155 vst	2u2	2u2	–	2u2	2u2
2158	22u	47u	47u	22u	22u
2330	470u	470u	220u	220u	470u
2370	470u	–	–	–	470u
2389	220n	220n	220n	–	220n
2393	–	–	2n2	2n2	–
2395	–	–	2n2	2n2	–
2396	–	–	2n2	2n2	–
2673pb	–	–	–	–	–
2673 vst	22n	22n	–	22n	22n
2674 vst	22n	22n	–	22n	22n
2675 vst	33u	33u	–	33u	33u
2676 pb	100n	–	100n	100n	100n
2676 vst	–	–	–	–	–
2677 pb	15n	–	15n	15n	15n
2677 vst	22n	22n	–	22n	22n
2678 pb	100n	–	100n	100n	100n
2678 vst	4n7	4n7	–	4n7	4n7
2680 pb	22u	–	22u	22u	22u
2680 vst	150u	150u	–	150u	150u
2682 pb	330u	–	330u	330u	330u
2682 vst	470u	470u	–	470u	470u
2683 pb	22u	–	22u	22u	22u
2683 vst	10u	10u	–	10u	10u
2684 vst	330p	330p	–	330p	330p
2810	120n	–	–	–	–
2811	560n	680n	680n	680n	680n
2870	3n3	2n2	2n2	2n2	2n2
3101 pb	18k	–	18k	18k	18k
3101 vst	15k	15k	–	15k	15k
3103	18R	470R	470R	18R	18R
3105 vst	10k	10k	–	10k	10k
3108	10R	100R	100R	–	10R
3113	10R	–	–	10R	10R
3116	–	150R	150R	–	–
3121	56R	0R	0R	0R	0R
3122	22R	82R	68R	82R	82R
3123	3k3	–	–	–	–
3124	10k	–	–	–	–
3156	180R	330R	330R	180R	180R
3157	2k7	1k0	1k	2k7	2k7
3158	10k	2k2	2k2	10k	10k
3360 pb	2R2	–	2R2	2R2	2R2
3360 vst	1R	1R	–	1R	1R
3362 vst	12k	12k	–	12k	12k
3365 vst	10k	10k	–	10k	10k
3368 vst	56R	56R	–	56R	56R
3392	220R	220R	220R	–	220R
3393 PTC	110/220V	–	110/220V	–	110/220V
3501	91k	91k	91k	82k	91k
3511	560k	560k	560k	300k	560k
3663	1k2	–	–	–	–
3664	1k2	–	–	–	–
3665 pb	0R	–	0R	0R	0R
3665 vst	–	–	–	–	–
3666 pb	2k2 lin	–	2k2 lin	2k2 lin	2k2 lin
3666 vst	–	–		–	–
3667 vst	22k	22k	–	22k	22k
3668 vst	22k	22k	–	22k	22k
3673 vst	47k	47k	–	47k	47k
3676 vst	22k	22k	–	22k	22k
3678 pb	3k	–	3k	3k	3k
3678 vst	39	39k	–	39k	39k
3681 pb	3R3	–	3R3	3R3	3R3
3681 vst	2R2	2R2	–	2R2	2R2
3682 vst	39k	39k	–	39k	39k
3683 pb	160R	–	160R	160R	160R
3683 vst	680R	680R	–	680R	680R
3685 vst	3k3	3k3	–	3k3	3k3
3816	15k	–	–	–	–
3817	2k2	–	–	–	–
3870	20k	36k	36k	36k	36k
3873	220k	–	–	–	–
5121 ..uH	0.32	–	–	–	–
5392 ..uH	27.4	27.4	27.4	–	27.4
5672 ..uH	12.5	–	–	–	–
5675 ..uH	8.4	8.4	8.4	6.7	8.4
6102 BA484	X	–	–	–	–
6103 1N4148	–	X	X	–	–
6392 BYM566E	X	X	–	–	X
6392 1N5062	–	–	X	X	–
6394 1N5062	X	–	–	–	X
6395 1N5062	–	–	X	X	–
6396 1N5062	–	–	X	X	–
6661 1n4148	X	–	–	–	–
6662 1N4148	X	–	–	–	–
6665 vst 1N4148	X	X	–	–	–
6873 1N4148	X	–	–	–	–
7151 TDA3540	–	X	X	–	–
7151 TDA3541	X	–	–	X	X
7368 vst BC548	X	X	–	X	X
7877 BC548	X	–	–	–	–
Jumper C pb	cl	–	cl	cl	cl
Jumper C vst	–	–	–	–	–
Jumper D	–	cl	cl	cl	–
Jumper E pb	cl	–	cl	cl	cl
Jumper E vst	–	–	–	–	–
(cl = closed)					

* Items only present when marked with "X"

LIST OF SYMBOLS

	Changer, general		AND gate		Amplifier, general
	Burst key separator		De-emphasis		Stand-by
	Synchronisation separator		Pulse-width modulator		On/off
DIV.	Divider	90°	90° phase shifter		Output stage
φ	Phase changing network		Electronic switch		Controlled amplifier
	Automatic gain control		Variable impedance	M	Mixer stage
F.F. H/2	Flip-flop on half line frequency		Display		Amplifier with limiter
G	Square wave generator	ns	Delay element		Positive peak clipper
G	Sawtooth generator		Detector	0	Black level restorer
G	Sinewave generator		Phase detector		Coaxial aerial input
G	Adjustable sinewave generator		Voltage stabilizer		RC network (integrator)
	Rejection filter		FM detector	matrix	Decoding matrix
	Balance control		Phase discriminator	I.R.	Infra red transmitter
	Volume control		Colour killer	I.R.	Infra red receiver
	Bass and treble control		Spatial stereo		Multi-function switch
	Shaper	G	Sandcastle generator	PAL	Modulator
	Oscillator	Σ	Adder circuit	÷2 + 90	Divider + 90° phase shifter



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SYMBOLS USED IN CIRCUIT DIAGRAMS

SYMBOL	TYPE	$t_{amb}^{P_{70°}}$	TOLERANCE	SERIES
	SFR16T	0.5	1E - 3M 5%	E24
	SFR25H	0.5	1E - 10M 5%	E24
	MRS25	0.6	1E - 1M 1%	E24
	MR30	0.5	1E - 1M 1% (2%)	E24
	VR37	0.5	220K - 33M 5%	E24
	PR37	1.6	1E - 1M 5%	E24
	VR68	1	100K - 68M 5%	E24
	MRS16T	0.4	10R-100K	E24/E96

SYMBOL	TYPE	VOLTAGE DC	TOLERANCE
	POLYESTER FLATFOIL	SEE NOTE	10%
	PLATE CERAMIC	SEE NOTE	DEPENDING ON CAPACITY
	ELCO MINIATURE SINGLE	SEE NOTE	-10+50%
	ELCO SINGLE ENDED	SEE NOTE	±20%

NOTE:
*

	f = 25V	q = 200V	x = 1000V	E = 20V
	g = 40V	r = 250V	z = 1600V	F = 25V
a = 2.5V	h = 63V	s = 300V	A = 1.6V	G = 50V
b = 4V	j = 100V	t = 350V	B = 6V	H = 75V
c = 6.3V	l = 125V	u = 400V	C = 12V	I = 80V
d = 10V	m = 150V	v = 500V	D = 15V	
e = 16V	n = 160V	w = 630V		

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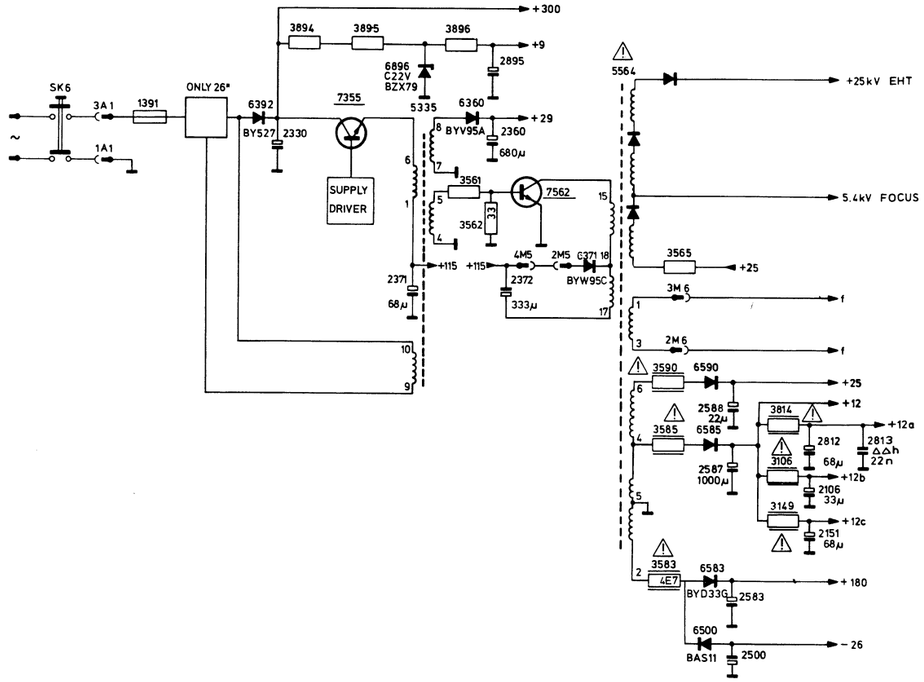
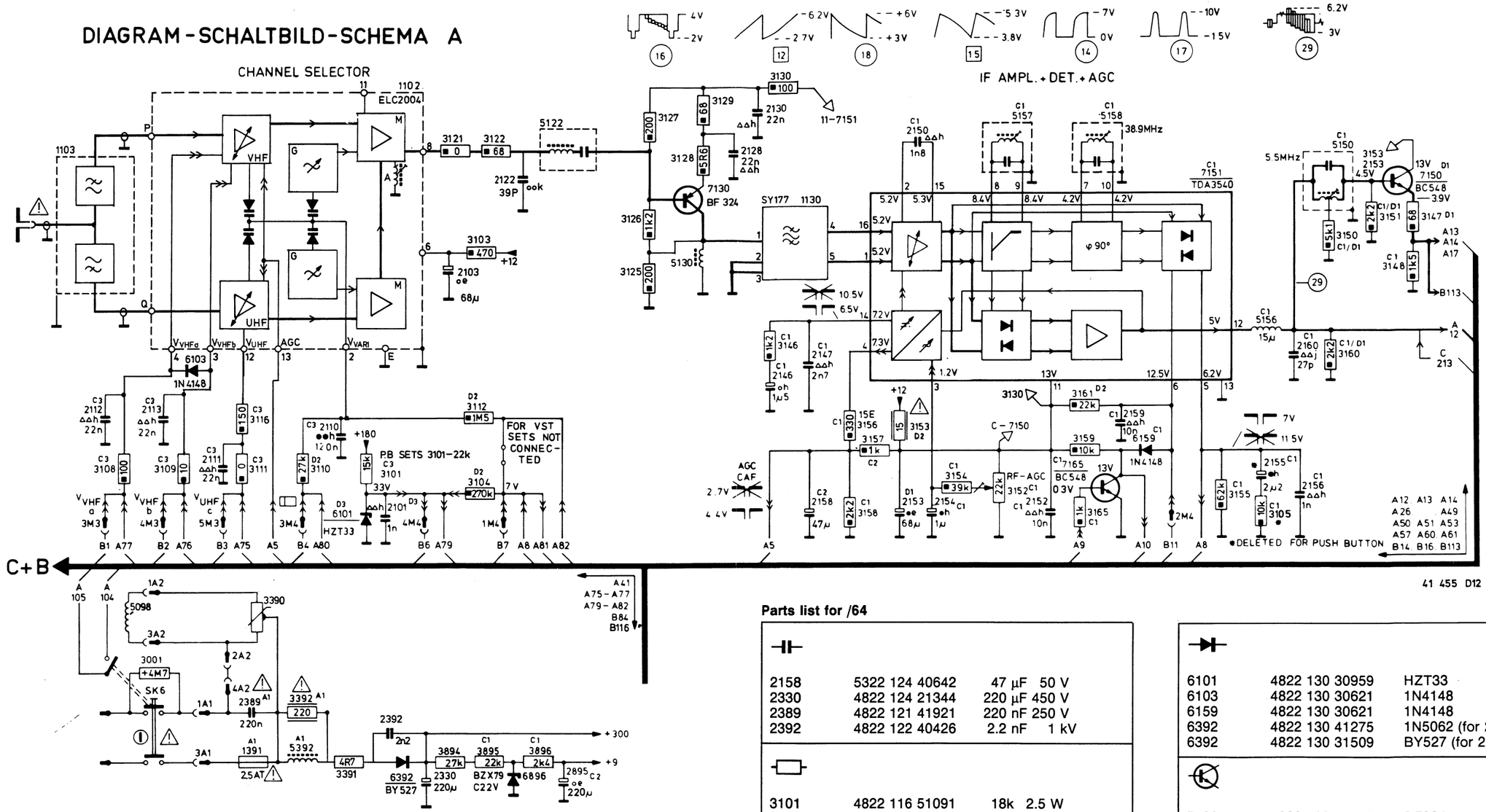
Circuit	Voltage													
	25 kV	5.4 kV	ff	+300	+180	+115	+29	+25	+12	+12a	+12b	+12c	+9	-26
Tuner					X				X					
IF+Det.+AGC									X					
Chrominance+Luminance									X					
RGB amplifiers					X									
Picture tube	X	X	X		X									
Synchronisation								X	X	X			X	
Supply				X										
Frame output								X						
Line output						X		X						
E-W correction														X
Sound							X							
Control circuit											X	X		



37 725 C12/636

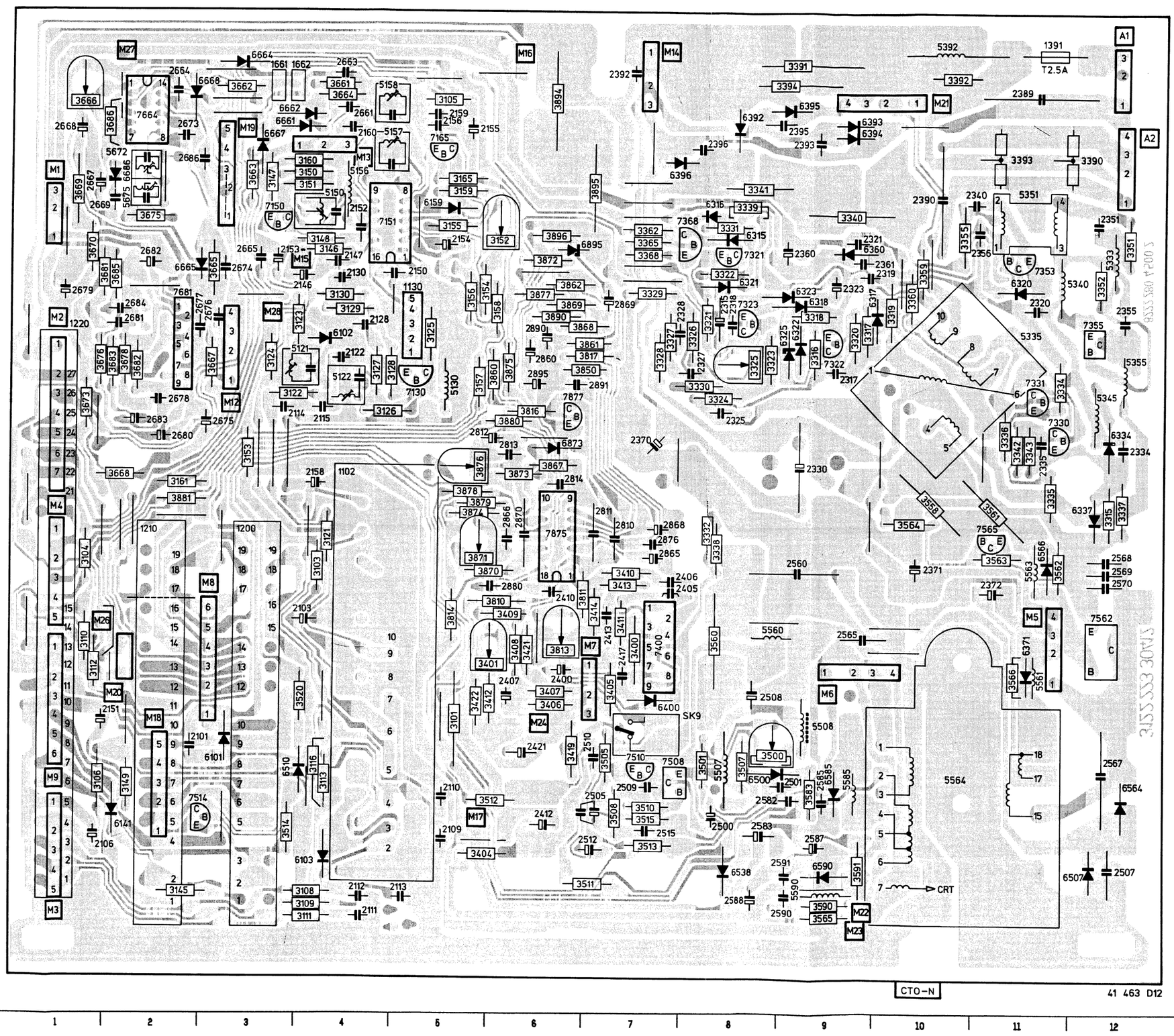


Parts list for /64

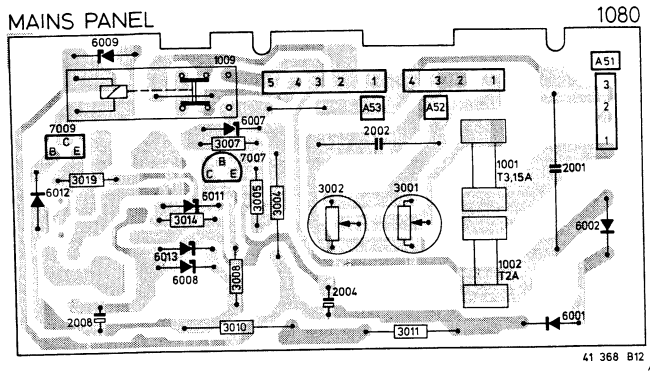
2158	5322 124 40642	47 µF 50 V
2330	4822 124 21344	220 µF 450 V
2389	4822 121 41921	220 nF 250 V
2392	4822 122 40426	2.2 nF 1 kV
3101	4822 116 51091	18k 2.5 W
3152	4822 100 10051	22k potm.
3153	4822 111 30513	15R 0.33 W
3390	4822 116 40036	110/220 V PTC
3391	4822 122 32427	4R7 10 W
3392	4822 111 30544	220R 0.33 W
3894	5322 116 54983	27k
3895	4822 116 51085	22k
5122	4822 157 52742	0.58 µH
5130	4822 157 51724	1.2 µH
5150	4822 156 20802	10.1 µH
5156	4822 157 50965	15 µH
5157	4822 156 20799	0.28 µH
5158	4822 156 21299	38.9 Mc
5392	4822 157 52143	27.4 µH
6101	4822 130 30959	HZT33
6103	4822 130 30621	1N4148
6159	4822 130 30621	1N4148
6392	4822 130 41275	1N5062 (for 26")
6392	4822 130 31509	BY527 (for 20")
7130	4822 130 41448	BF324
7150	4822 130 40938	BC548
7165	4822 130 40938	BC548
7151	4822 209 10939	TDA3540

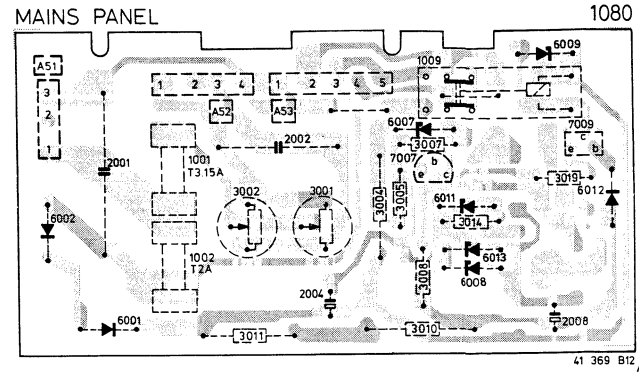
VARIOUS

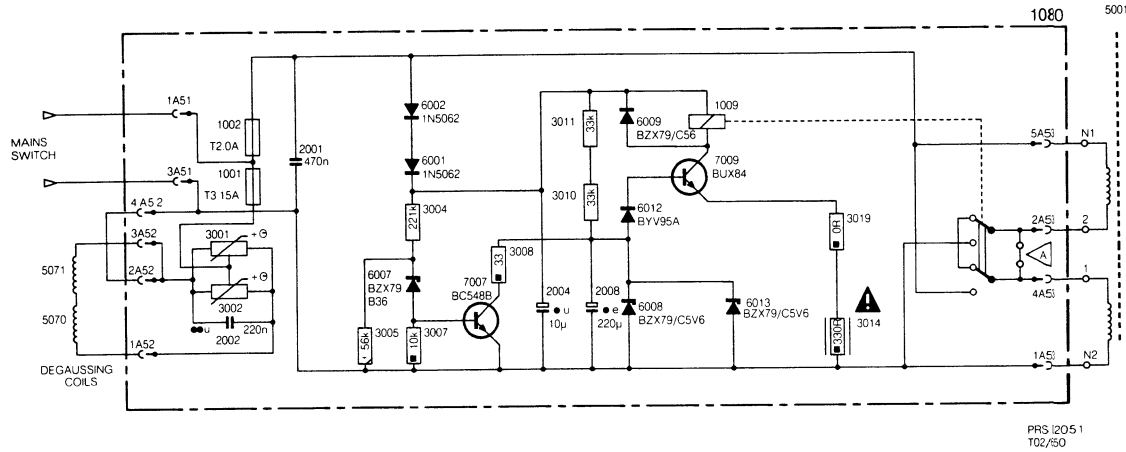
1102	4822 210 40159	ELC2004
1103	4822 218 20347	Aerial unit
1130	4822 242 71742	Ceramic filter
1391	4822 253 30026	2.5 A
5098	4822 157 51645	Degaussing coil
SK6	4822 276 11589	Mains switch



1102	E 4	2676	D 3	3390	B12	5345	D12						
1130	C 5	2677	D 3	3391	A 9	5351	B11						
1200	F 3	2678	D 2	3392	A10	5355	D12						
1210	F 2	2679	C 1	3393	B11	5392	A10						
1220	D 1	2680	E 2	3394	A 9	5507	H 8						
1391	A11	2681	D 2	3400	G 7	5508	H 9						
1661	A 3	2682	C 2	3401	G 6	5560	G 8						
1662	A 3	2683	E 2	3404	I 5	5561	G11						
2101	H 3	2684	D 2	3405	G 7	5563	F11						
2103	G 4	2686	B 2	3406	H 6	5564	H10						
2106	I 2	2810	F 7	3407	G 6	5585	H 9						
2109	I 5	2811	F 7	3408	G 6	5590	I 9						
2110	H 5	2812	E 5	3409	G 6	5672	B 2						
2111	J 4	2813	E 6	3410	F 7	5675	B 2						
2112	I 4	2814	E 6	3411	G 7	6101	H 3						
2113	I 5	2860	D 6	3412	G 6	6102	D 4						
2114	E 4	2865	F 7	3413	F 7	6103	I 4						
2115	E 4	2866	F 6	3414	G 7	6141	I 2						
2122	D 4	2868	F 7	3419	H 6	6159	B 5						
2128	D 4	2869	D 7	3421	G 6	6315	C 8						
2130	C 4	2870	F 6	3422	G 5	6316	B 8						
2146	C 4	2876	F 7	3500	H 8	6317	C10						
2147	C 4	2880	F 6	3501	H 8	6318	C 9						
2150	C 5	2890	D 6	3505	H 7	6320	C11						
2151	H 2	2891	D 7	3507	H 8	6321	C 8						
2152	C 4	2895	D 6	3508	I 7	6322	D 9						
2153	C 3	3101	H 5	3510	I 7	6323	C 9						
2154	C 5	3103	F 4	3511	I 7	6325	D 9						
2155	B 6	3104	F 1	3512	I 6	6334	E12						
2156	B 5	3105	A 5	3513	I 7	6337	F12						
2158	E 4	3106	H 2	3514	I 3	6360	C 9						
2159	B 5	3108	I 4	3515	I 7	6371	G11						
2160	B 4	3109	J 4	3520	G 4	6392	B 8						
2315	C 8	3110	G 1	3556	E10	6393	B 9						
2317	D 9	3111	J 4	3560	G 8	6394	B 9						
2318	C 8	3112	G 1	3561	F11	6395	A 9						
2319	C10	3113	H 4	3562	F11	6396	B 7						
2320	C11	3116	H 4	3563	F11	6400	H 7						
2321	C 9	3121	F 4	3564	F10	6500	H 8						
2323	C 9	3122	D 3	3565	J 9	6507	I12						
2325	E 8	3123	D 4	3566	G11	6510	H 4						
2327	D 8	3124	D 3	3583	H 9	6538	I 8						
2328	D 8	3125	D 5	3590	J 9	6564	H12						
2330	E 9	3126	E 4	3591	I 9	6566	F11						
2334	E12	3127	D 4	3661	A 4	6585	H 9						
2335	E11	3128	D 5	3662	A 3	6590	I 9						
2340	B11	3129	D 4	3663	B 3	6661	B 3						
2351	C12	3130	C 4	3664	A 4	6662	B 3						
2355	C12	3145	I 2	3665	C 3	6664	A 3						
2356	C11	3146	C 4	3666	B 1	6665	C 2						
2360	C 9	3147	B 3	3667	D 3	6667	B 3						
2361	C10	3148	C 4	3668	E 2	6668	A 3						
2370	E 7	3149	H 2	3669	B 1	6686	B 2						
2371	F10	3150	B 4	3670	C 1	6873	E 6						
2372	F11	3151	B 4	3673	E 1	6895	C 7						
2389	A11	3152	C 6	3675	C 2	7130	D 5						
2390	B10	3153	E 3	3676	D 1	7150	C 3						
2392	A 7	3154	C 6	3678	D 2	7151	C 4						
2393	B 9	3155	C 5	3681	C 2	7165	B 5						
2395	B 9	3156	C 5	3682	D 2	7321	C 8						
2396	B 8	3157	D 5	3683	D 2	7322	D 9						
2400	G 6	3158	D 6	3685	C 2	7323	D 8						
2405	F 8	3159	B 5	3686	B 2	7330	E11						
2406	F 8	3160	B 4	3810	G 6	7331	D11						
2407	G 6	3161	E 2	3811	F 7	7353	C11						
2410	F 6	3165	B 5	3813	G 6	7355	D12						
2412	I 6	3315	F12	3814	G 5	7368	C 8						
2413	G 7	3316	D 9	3816	E 6	7400	G 7						
2417	G 7	3317	D10	3817	D 7	7508	H 7						
2421	H 6	3318	D 9	3850	D 6	7510	H 7						
2500	I 8	3319	D10	3860	D 6	7514	I 3						
2501	H 9	3320	D 9	3861	D 7	7562	G12						
2505	H 7	3321	D 8	3862	C 6	7565	F11						
2507	I12	3322	C 8	3867	E 6	7664	B 2						
2508	G 8	3323	D 8	3868	D 6	7681	C 2						
2509	H 7	3324	D 8	3869	D 6	7875	F 6						
2510	H 7	3325	D 8	3870	F 5	7877	D 6						
2512	I 7	3326	D 8	3871	F 5	SK 9	H 8						
2515	I 7	3327	D 7	3872	C 6								
2560	F 9	3328	D 7	3873	E 6								
2565	G 9	3329	C 7	3874	F 5								
2567	H12	3330	D 8	3875	D 6								
2568	F12	3331	C 8	3876	E 5								
2569	F12	3332	F 8	3877	C 6								
2570	F12	3334	D11	3878	E 5								
2582	H 8	3335	E11	3879	E 5								
2583	I 8	3336	E11	3880	E 6								
2585	H 9	3337	F12	3881	F 2								
2587	I 9	3338	F 8	3890	D 6								
2588	J 8	3339	B 8	3894	A 6								
2590	J 9	3340	C 9	3895	B 7								
2591	I 9	3341	B 8	3896	C 6								
2661	B 4	3342	E11	5121	D 4								
2663	A 4	3343	E11	5122	D 4								
2664	A 2	3351	C12	5130	D 5								
2665	C 3	3352	C12	5150	B 4								
2667	B 1	3355	C10	5156	B 4								
2668	B 1	3359	C10	5157	B 4								
2669	C 1	3360	C10	5158	A 4								
2673	B 2	3362	C 7	5333	C12								
2674	C 3	3365	C 7	5335	D11								
2675	E 3	3368	C 7	5340	C12								



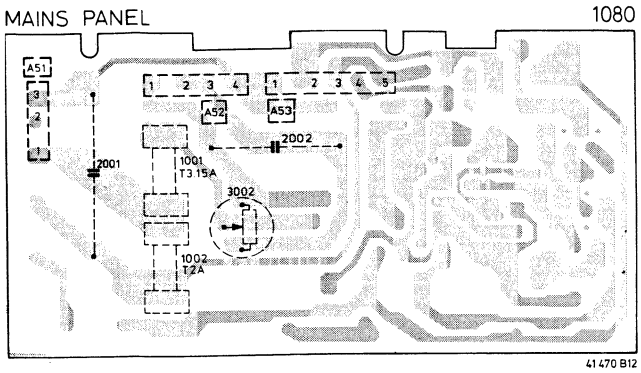


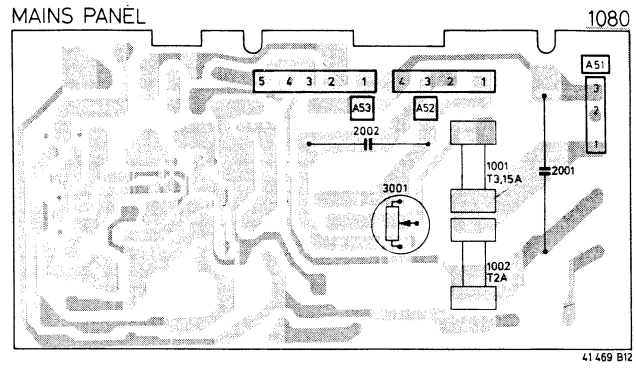


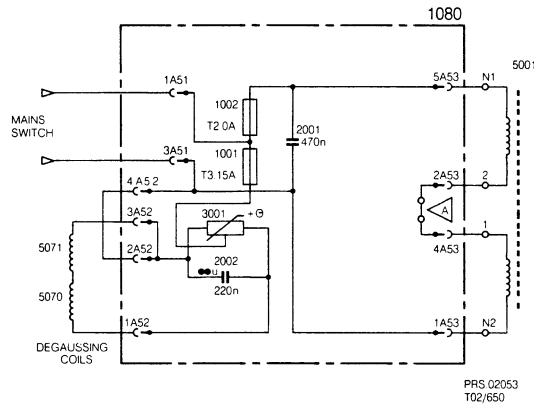
AUTO MULTIVOLTAGE PANEL

Various		
	4822 492 60063	Fuse holder
	5322 390 20011	silicone vet.
	4822 404 30616	support
1001	4822 253 30027	Fuse 3.15A slow
1002	4822 253 30025	Fuse T2A
1009	4822 280 70247	Relay
2001	4822 121 40517	470 nF 275 V
3001	4822 116 40036	Dual 110/220 V PTC
3002	4822 116 40036	Dual 110/220 V PTC
3004	4822 116 52674	221 kΩ 1 W
3010	4822 116 51736	33 kΩ 2.5 W
3011	4822 116 51736	33 kΩ 2.5 W

1N5062	4822 130 41275
BZX79-B36	4822 130 34368
BZX79-C5V6	4822 130 34173
BZX79-C56	4822 130 34258
BYV95A	4822 130 41601
BC548B	4822 130 40937
BUX84	4822 130 41121

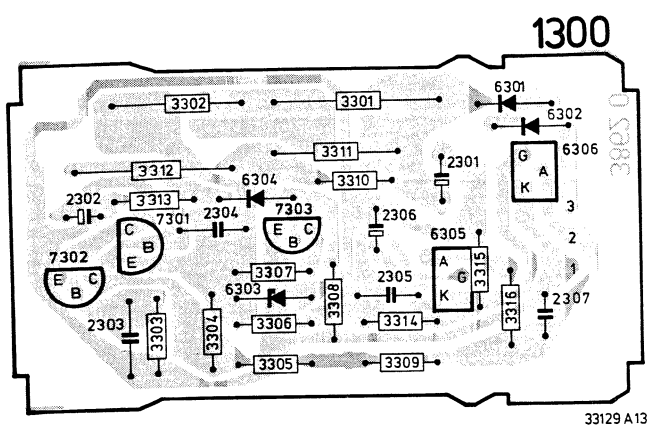


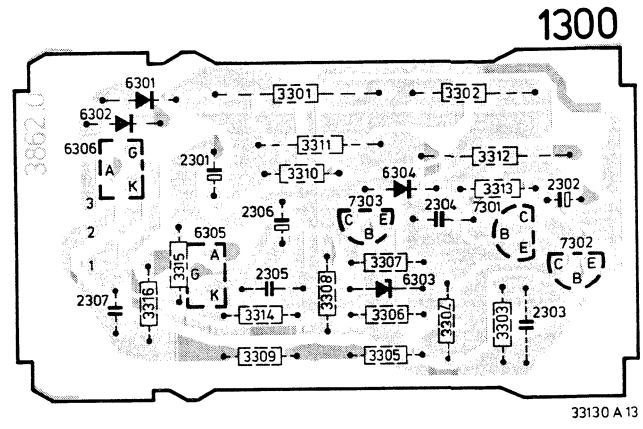


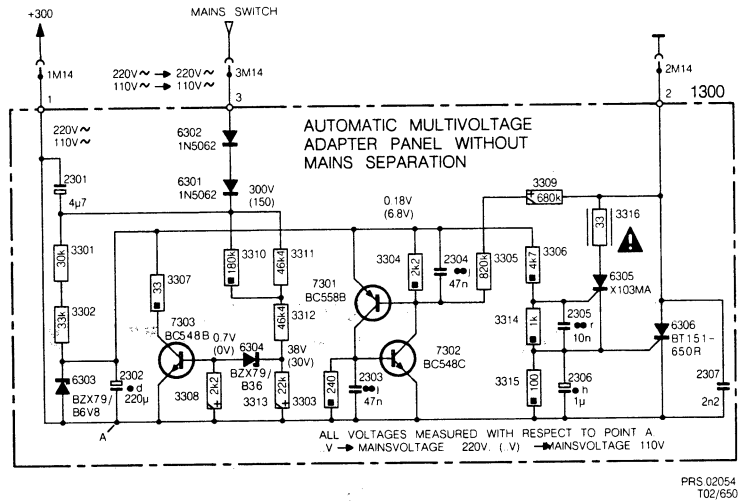


MAINS PANEL

3001	4822 116 40036	PTC Dual 110/220 V
2001	4822 121 40517	470 nF 275 V
Various		
	4822 492 60063	Fuse holder
1001	4822 253 30027	Fuse 3.15A slow
1002	4822 253 30025	Fuse T2A







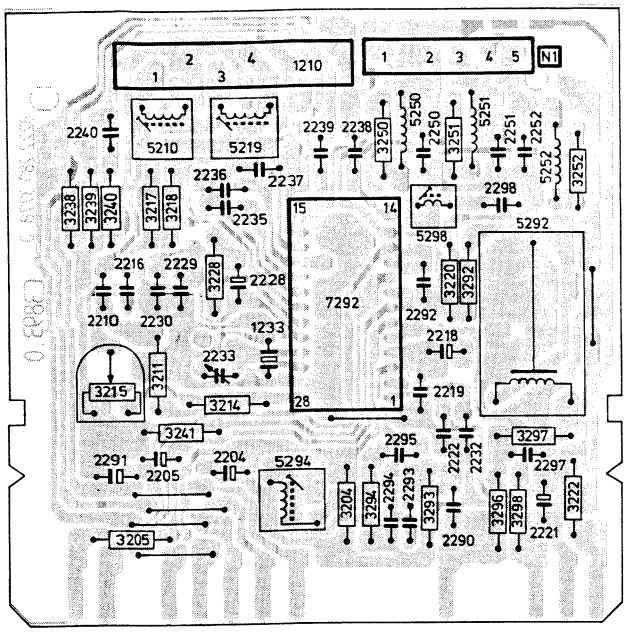
AUTOMATIC MULTI VOLTAGE PANEL

3301	4822 116 52133	30 kΩ 2.5 W
3302	4822 116 52943	33 kΩ 2.5 W
3305	4822 116 52131	820 kΩ 0.4 W
3311	4822 116 52132	46,4 kΩ 1 W
3312	4822 116 52132	46,4 kΩ 1 W
3316	4822 116 52094	33 Ω 0.5 W

6301	4822 130 41275	1N5062
6302	4822 130 41275	1N5062
6303	4822 130 34278	BZX79-B6V8
6304	4822 130 34368	BZX79-B36
6305	4822 130 20181	X0103MA thyristor
6306	5322 130 24081	BT151-650R thyristor

Various

2307	4822 122 40348	2,2nF 1 kV
7301	4822 130 44197	BC558B
7302	4822 130 44196	BC548C
7303	4822 130 40937	BC548B



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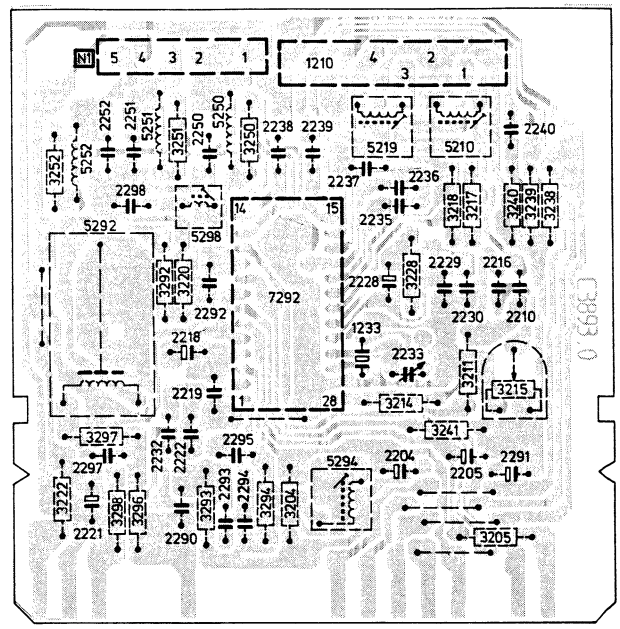
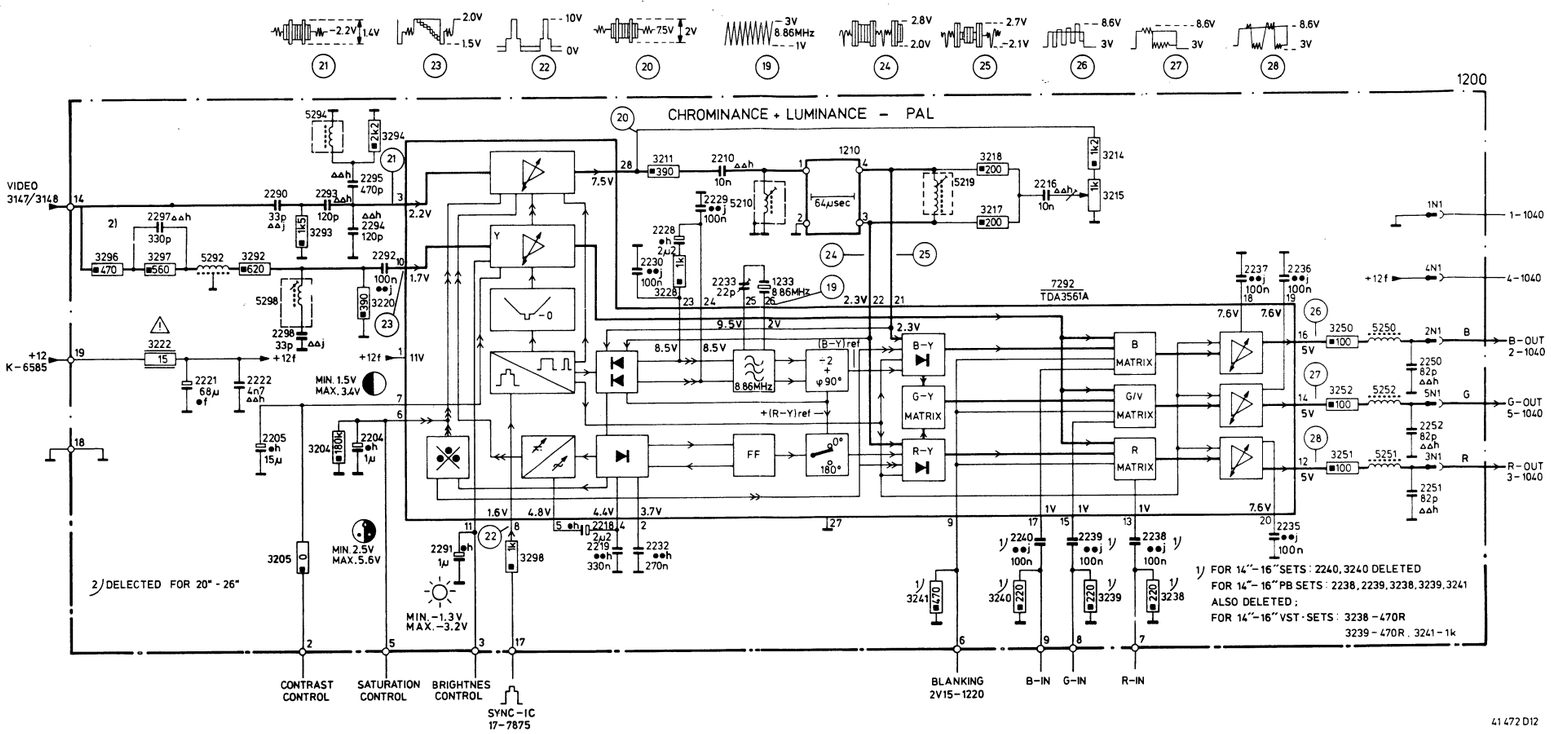


33189 A 13

PAL-MODULE

Various		
	4822 255 40156	Socket IC28 pins
	4822 267 40247	Socket 5 pins
1210	4822 320 40096	Delay line chrominance
1233	4822 242 70626	X-tal 8.86 MHz
2233	4822 125 50045	Trim cap 20 pF
3215	4822 100 10048	1 kΩ 0.1 W potm.
3222	4822 111 30513	15 Ω 0.33 W saf.
7292	4822 209 81239	TDA3561A
⎓		
5210, 5219	4822 157 52252	Coil 15 µH
5250	4822 157 50943	Coil 12 µH
5251	4822 157 50943	Coil 12 µH
5252	4822 157 50943	Coil 12 µH
5292	4822 157 51056	Delay line (330 nsec.)
5292	4822 320 40081	Delay line (470 nsec.)
5294	4822 157 51756	Coil 10 µH
5298	4822 156 21026	Coil 34 µH



ADJUSTMENTS

For adjustment 1 any colour signal may be used. Adjustment 2 and 3 are effected with a colour pattern generator PM5515 or PM5519.

1. Subcarrier oscillator

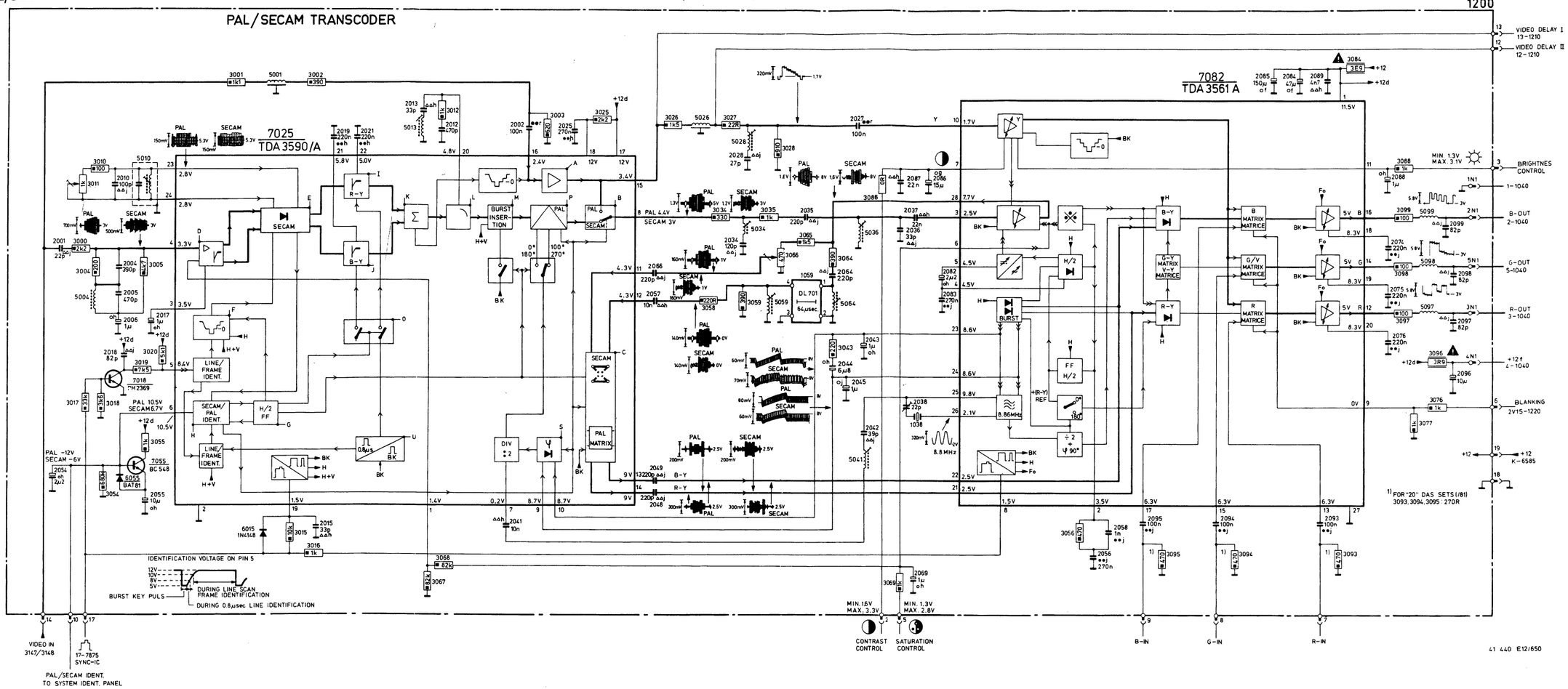
Apply a colour signal and set the receiver controls to their normal settings.
Interconnect points 23 and 24 of 7292.
Include a 470 Ω resistor between point 6 and point 1 of 7292.
Adjust 2233 in such a manner that the colour on the screen has practically come to a standstill.
Remove the resistor and the interconnection.

2. PAL-delay line

Apply a generator signal. Set the generator to position "DEM", adjust brightness to normal and the saturation control to ¾ of its range.
Adjust 3215 so that the venetian blinds effect in the third bar disappears.
Next, adjust 5210 so that the venetian blinds effect in the first and fourth bar disappears.
Readjust 3215.
Set the generator to "Colour Bar" position and adjust 5219 so that the venetian blinds effect in the third and/or the fifth bar from the left hand side (resp. cyan and magenta) disappears.

3. The 4.43 MHz trap in the luminance circuit

Use a colour bar pattern. The receiver is normally adjusted.
Connect an oscilloscope to point 10 of 7292 and adjust 5298 to minimum amplitude of the chrominance signal present on the various brightness steps of the luminance signal.



ADJUSTMENTS

For adjustment 1 any colour signal may be used. Adjustment 2 till 7 are effected with a colour pattern generator PM5515 or PM5516.

1. Subcarrier oscillator

Apply a colour signal and set the receiver controls to their normal settings.
Interconnect points 23 and 24 of 7082.
Include a 470 Ω resistor between point 6 and point 1 of 7082.
Adjust 2038 in such a manner that the colour on the screen has practically come to a standstill.
Remove the resistor and the interconnection.

2. PAL-delay line

Apply a generator signal. Set the generator to position "DEM", adjust brightness to normal and the saturation control to ¾ of its range.
Adjust 3066 so that the venetian blinds effect in the third bar disappears. Next, adjust 5064 so that the venetian blinds effect in the first and fourth bar disappears.
Readjust 3066.
Set the generator to "Colour Bar" position and adjust 5059 so that the venetian blinds effect in the third and/or the fifth bar from the left hand side (resp. cyan and magenta) disappears.

3. The 4.43 MHz trap in the luminance circuit

Use a colour bar pattern. The receiver is normally adjusted.
Connect an oscilloscope to point 10 of 7082 and adjust to minimum amplitude to the chrominance signal present on the various brightness steps of the luminance signal.

4. Demodulator phase

Set the generator to position "DEM", PAL system.
Adjust 5064 until the two grey blocks in the top centre of the picture have the same colour.
If necessary repeat the adjustment of 3066 (see "PAL delay line").

5. Secam demodulator

Set the generator to position "CONV.", SECAM system.
Connect an oscilloscope to pin 3 on 7082.
Adjust the time base of the oscilloscope such that at least 2 complete line durations are visible.
Turn 3011 fully anti-clockwise, viewed from the component side.
Adjust 5010 until the amplitude of the chroma signal during one line equals that of the chroma signal of the next line.
Adjust 3011 for minimum signal amplitude.
If the signal of one line and the signal of the adjacent line do not reach their minimum simultaneously, 5010 should be readjusted slightly.

6. Chrominance response curve

Switch off the apparatus.
Apply the signal of a signal generator to 14-1200 via a 100 pF capacitor.
Connect an oscilloscope, aquipped with a 10:1 attenuation head to pin 4 on 7025.
Set the frequency of the signal generator to 4,32 MHz, unmodulated.
Adjust 5004 for maximum signal amplitude of the oscilloscope picture.
Transfer the signal of the signal generator to 8-7025 via a 100 pF capacitor.
Connect an oscilloscope to pin 3 of 7082.
Set the frequency of the signal generator to 4,3 MHz, unmodulated.
Adjust 5036 for maximum signal amplitude of the oscilloscope picture.
Set the frequency of the signal generator to 2,4 MHz.
Adjust 5034 for minimum signal amplitude.

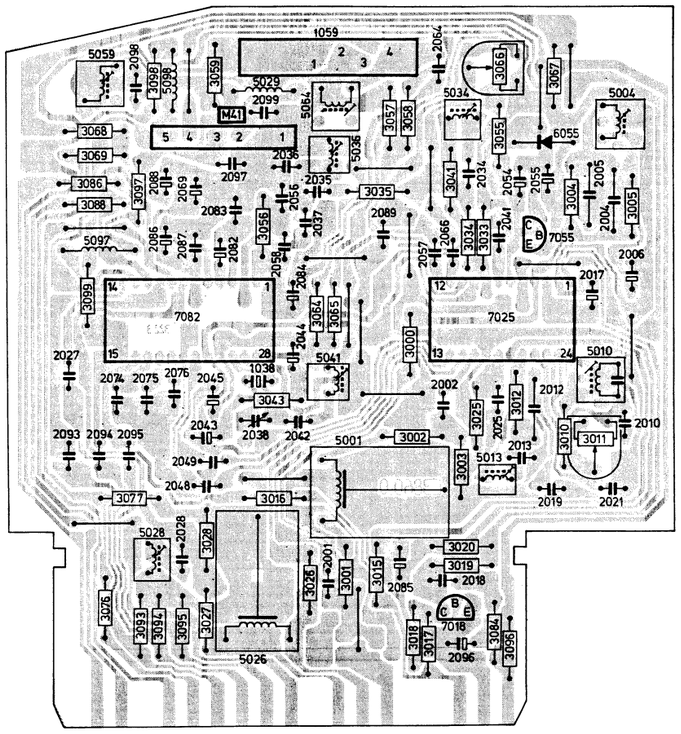
7. 8.867 MHz rejection

Switch on the apparatus.
Apply a signal of 8.867 MHz of a signal generator (e.g. PM5326) to pin 20 of 7025 (± 30 mVpp).
Connect an oscilloscope to the same point.
Adjust 5013 for minimum signal amplitude of the oscilloscope picture.

8. Phase 8.867 MHz reference

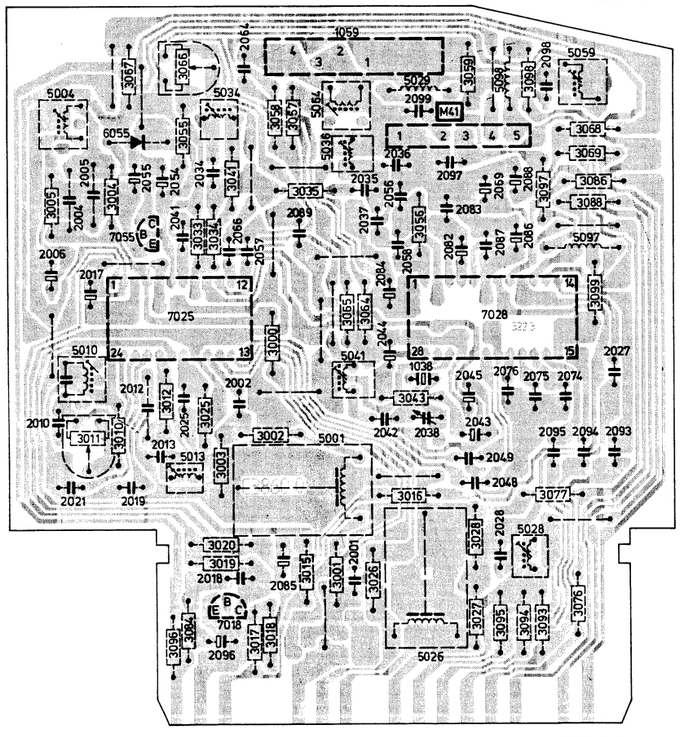
Switch of the apparatus.
Apply a signal of 6,5 MHz 100 mVpp via a resistor of 75 Ω to pin 25 of 7082.
Connect an oscilloscope to 7 of 7025.
Adjust 5041 for maximum signal amplitude of the oscilloscope picture.

1200



33153 B 13

1200



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Capacitors			
2004	5322 121 54128	390 pF	250 V
2005	5322 121 54078	470 pF	250 V
2012	5322 121 54078	470 pF	250 V
2038	4822 125 50045	20 pF	trimming
2055	4822 124 40435	10 µF	50 V
2096	4822 124 40435	10 µF	50 V
Resistors			
3011	5322 100 10112	1k trimming lin.	
3066	4822 100 10038	470 Ω trimming lin.	
3084	4822 111 30497	3,9 Ωsaf.	
3096	4822 111 30497	3,9 Ωsaf.	
Various			
1038	4822 242 70626	X-tal 8.86 MHz	
1059	4822 320 40096	Delay line 64 µsec.	
6055	4822 130 31353	Diode BAT81	
7018	4822 130 41594	Transistor PH2369	
7025	4822 209 81875	Integr. circ. TDA3590/A	
7055	4822 130 40938	Transistor BC548	
7082	4822 209 81239	Integr. circ. TDA3561A	
6015	4822 130 30621	Diode IN4148	

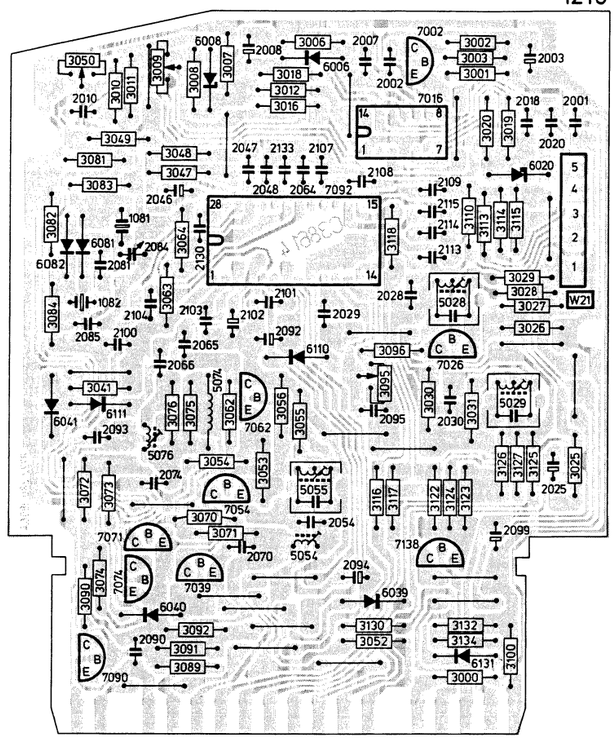
Coils		
5001	4822 320 40081	Delay line 470 nsec.
5004	4822 156 20872	2,95 µH
5010	4822 156 21148	7,6 µH
5013	4822 156 21147	7,2 µH
5026	4822 320 40103	Delay line 270 nsec.
5028	4822 156 21026	34 µH
5034	4822 156 21026	34 µH
5036	4822 156 21146	26 µH
5041	4822 156 21026	34 µH
5059	4822 156 20916	10 µH
5064	4822 156 20916	10 µH
5097	4822 157 50943	12 µH
5098	4822 157 50943	12 µH
5099	4822 157 50943	12 µH

2084	**4822 125 50045**	**22 pF trimming**
3009	**4822 100 10027**	**10kΩ lin. trimming**
3050	**4822 101 20901**	**10kΩ trimming**
3095	**4822 100 10024**	**10kΩ lin. trimming**
3100	**4822 111 30506**	**8,2Ω saf.**
5028	**4822 157 51641**	**Coil 15,3µH**
5029	**4822 157 51641**	**Coil 15,3µH**
5054	**4822 156 21026**	**Coil 34µH**
5055	**4822 157 51641**	**Coil 15,3µH**
5074	**4822 157 50965**	**Coil 15µ**
5076	**4822 156 10517**	**Coil 22µH**

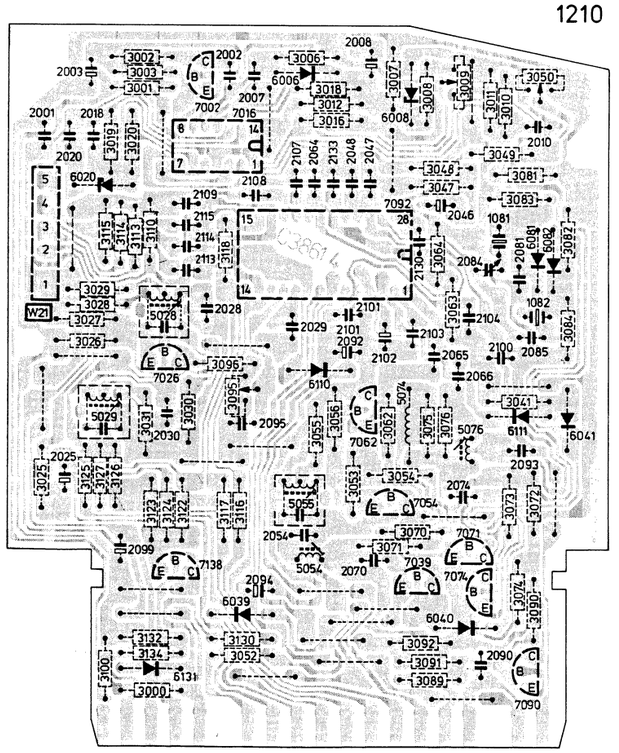
Various

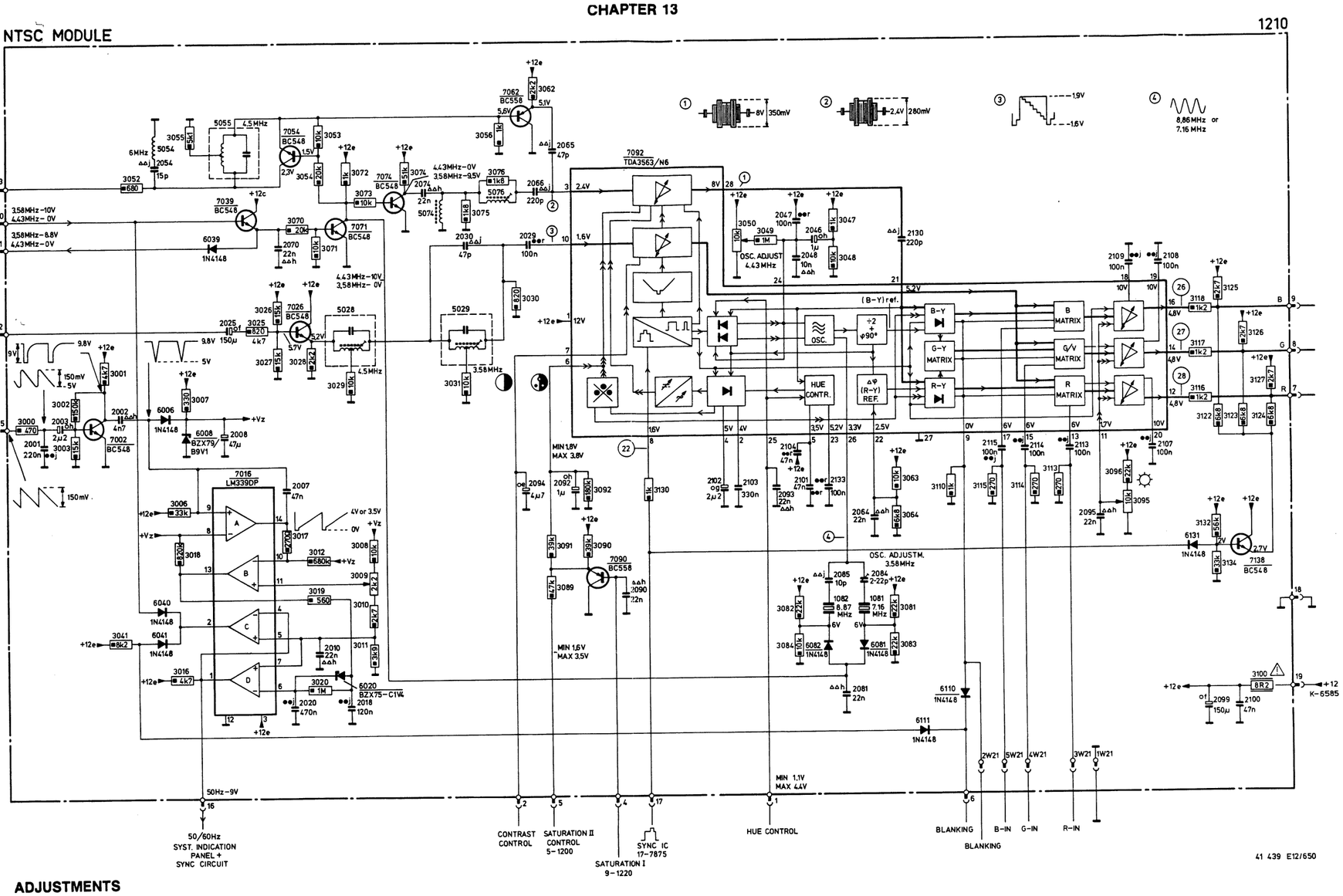
1081	**4822 242 70736**	**X-tal 7.159 MHz**
1082	**4822 242 70626**	**X-tal 8.86 MHz**
	4822 130 30621	**Diode 1N4148**
6008	**4822 130 30862**	**Diode BZX79-B9V1**
6020	**4822 130 34047**	**Diode BZX75-C1V4**
	4822 130 40938	**Transistor BC548**
	4822 130 40941	**Transistor BC558**
7016	**4822 209 80631**	**IC LM339N**
7092	**4822 209 81874**	**IC TDA3563**
	4822 255 40156	**Socket IC 28 pins**

1210



1210





ADJUSTMENTS

1. 50/60 Hz detector

Disconnect 3000 from 15-1210.
Inject a signal of 500 mV-55 Hz square wave (e.g. PM5107) into 3000.
Adjust 3009 until the voltage on 11-7016 is at minimum.
Measure the voltage on 2-7016.
Now increase the voltage on 11-7016 by 3009 until the voltage on 2-7016 changes.
Connect 3000.

2. Chrominance and Luminance bandpass

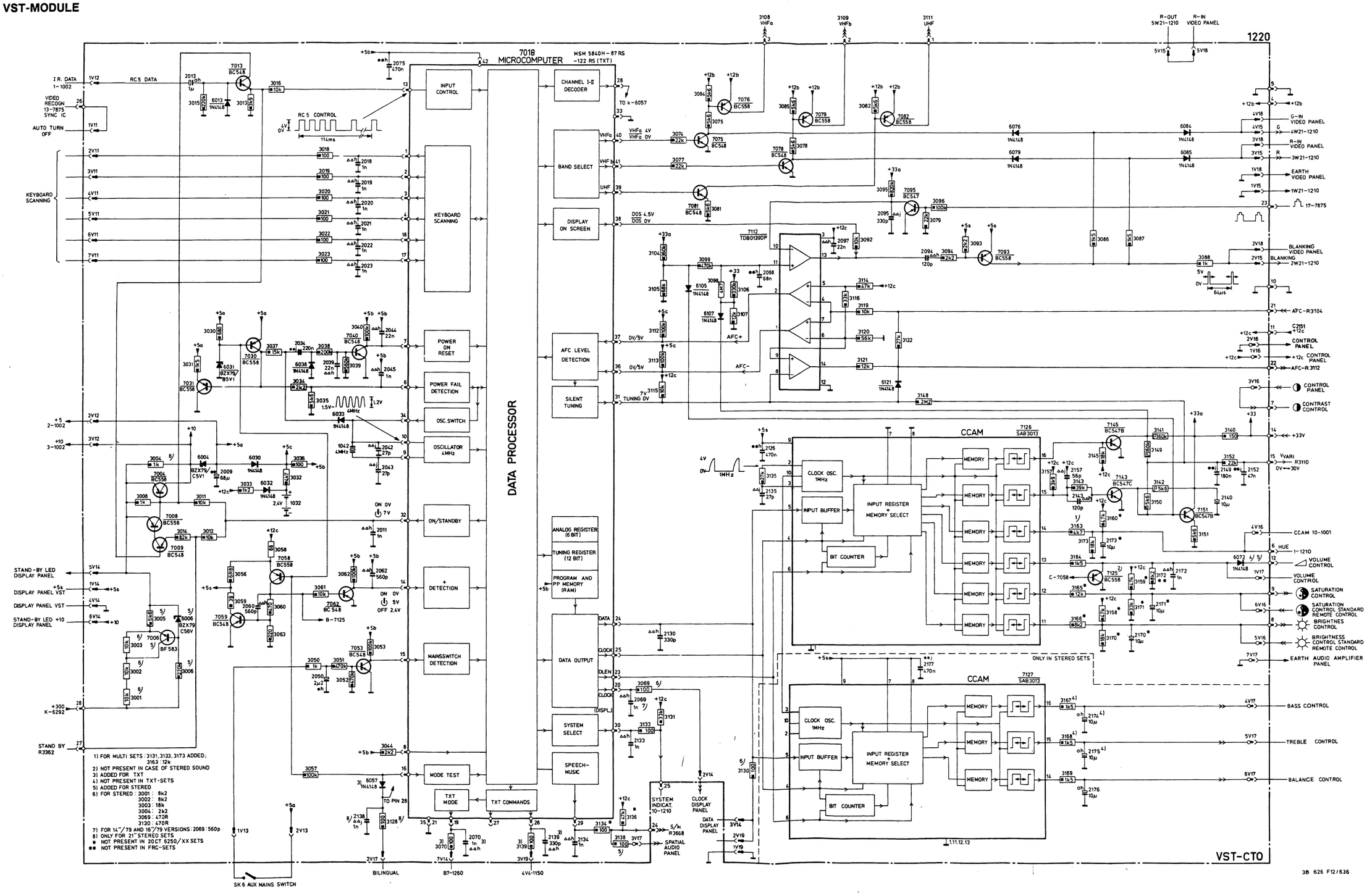
Disconnect 3052 from 13-1210.
Inject a signal of 1.8 MHz, 500 mVpp into 3052 (PM5334).
Connect an oscilloscope to 3-7092.
Adjust 5076 for minimum signal amplitude of the oscilloscope picture.
Change input signal to 4.5 MHz, 500 mVpp.
Adjust 5055 for minimum signal amplitude of the oscilloscope picture.
Change input signal to 6.0 MHz, 500 mVpp.
Adjust 5054 for minimum signal amplitude of the oscilloscope picture.
Connect 3052.
Disconnect 3025 from 2025.
Inject a signal of 4.5 MHz, 500 mVpp into 3025.
Connect the oscilloscope to 10-7092.
Adjust 5028 for minimum signal amplitude of the oscilloscope picture.
Change the input signal to 3.58 MHz, 500 mVpp.
Adjust 5029 for minimum signal amplitude of the oscilloscope picture.
Connect 3025.

3. Brightness

Apply a signal from NTSC pattern generator (e.g. PM5512).
Connect an oscilloscope to 9-1210.
Adjust 3095 for black level at 2 V_{dc}.

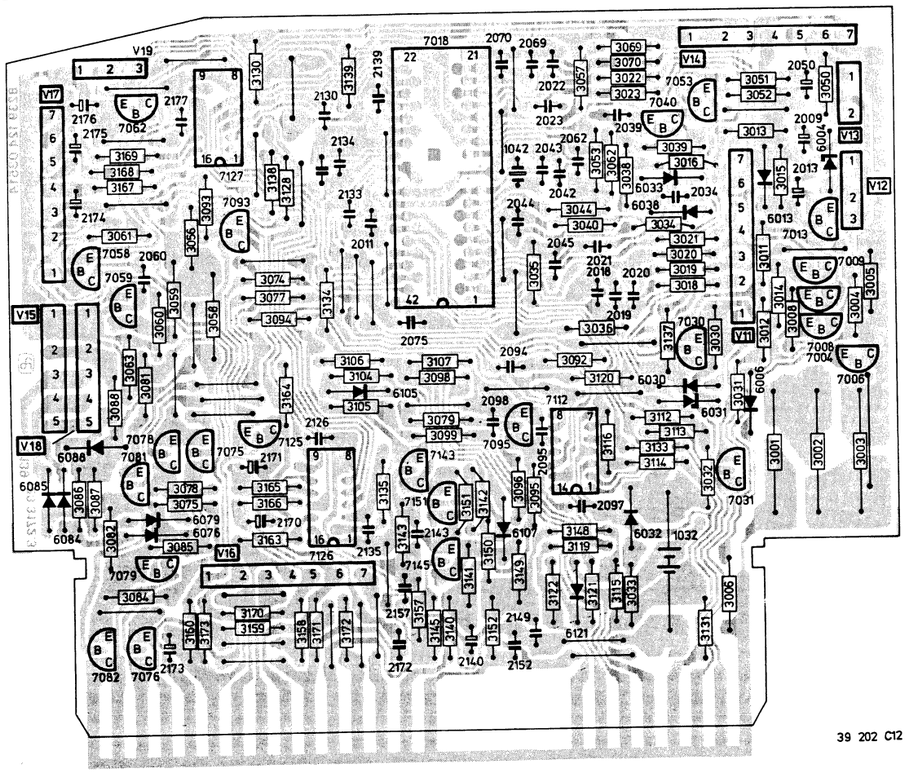
4. Oscillator frequency

Connect the oscilloscope to 11-7092.
Adjust 3095 for 2 V_{dc} on the oscilloscope picture.
Connect 10-7092 to earth (27-7092).
Apply a NTSC -4.43 MHz signal from an adapted PM5519 to the aerial input.
Connect 6-7092 to 1-7092.
Adjust 3050 in such a manner that the colour on the screen has practically come to a standstill.
Now apply a NTSC -3.58 MHz signal from a PM5512 to the aerial input.
Connect 10-7092 via a 10k resistor to 1-7092.
Adjust 2084 in such a manner that the colour on the screen has practically come to a standstill.
Remove the interconnections and the resistor.

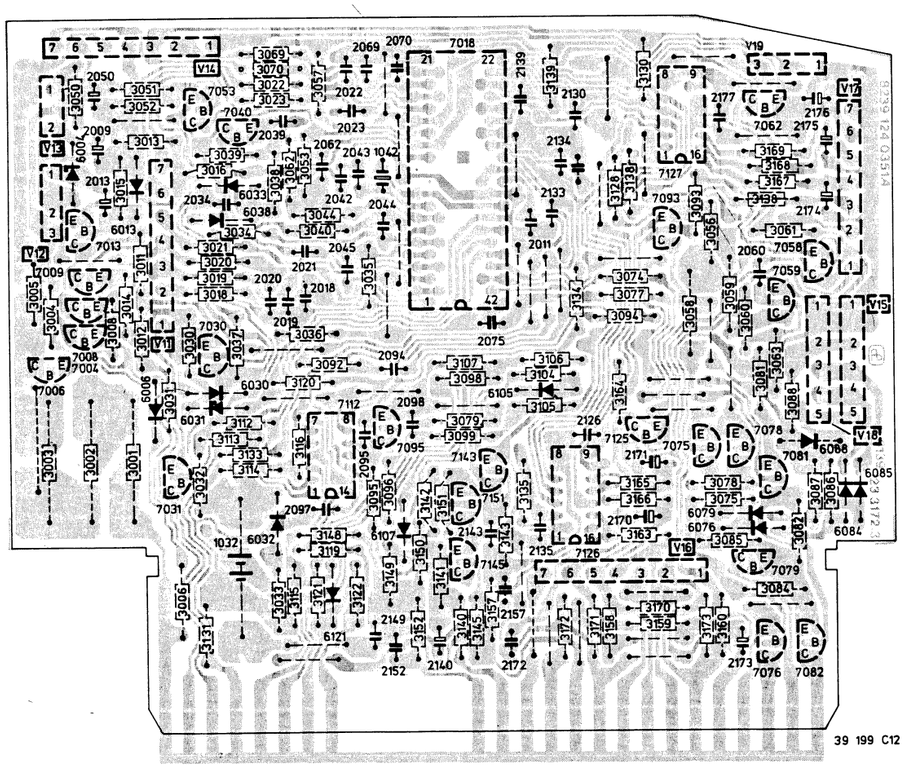

7018 MICROCOMPUTER MSM 5840H-87 RS -122 RS (TXT)
DATA PROCESSOR
INPUT CONTROL
KEYBOARD SCANNING
POWER ON RESET
POWER FAIL DETECTION
OSC. SWITCH
OSCILLATOR 4MHz
ON/STANDBY
+ DETECTION
MAINSSWITCH DETECTION
MODE TEST
CHANNEL I-II DECODER
BAND SELECT
DISPLAY ON SCREEN
AFC LEVEL DETECTION
SILENT TUNING
ANALOG REGISTER (6 BIT)
TUNING REGISTER (12 BIT)
PROGRAM AND PP MEMORY (RAM)
DATA OUTPUT
SYSTEM SELECT
SPEECH-MUSIC
TXT MODE
TXT COMMANDS
CCAM
CLOCK OSC. 1MHz
INPUT BUFFER
INPUT REGISTER + MEMORY SELECT
BIT COUNTER
MEMORY
1220
VST-CTO
38 626 F12/636
CS 6 419

VST MODULE

1220



1220



VST MODULE

1220

3001	5322 116 54989	10 kΩ	2 W
3002	5322 116 54989	10 kΩ	2 W
3003	5322 116 54989	10 kΩ	2 W
3058	5322 116 54984	68 Ω	1.6 W
3059	4822 116 52363	39 Ω	0.5 W
3095	4822 116 52131	820 kΩ	0.4 W
3098	4822 110 72205	4,7 MΩ	HT

4822 130 40941	BC558	
4822 130 40938	BC548	
4822 130 44257	BC547	
4822 130 44503	BC547C	
4822 130 40959	BC547B	
4822 130 34233	BZX79-C5V1	
4822 130 34233	BZX79-C5V1	
4822 130 30621	1N4148	

Various

	4822 255 40299	IC socket
1032	4822 138 10032	Battery 2.4 V
1042	4822 242 70668	X-tal 4 MHz
7018	4822 209 10907	IC MSM5840H-87RS
7112	4822 209 82135	IC TDB0139DP
7126	4822 209 10102	IC SAB3013

2140	4822 124 40435	10 µF 50 V
2170	4822 124 40435	10 µF 50 V
2171	4822 124 40435	10 µF 50 V
2173	4822 124 40435	10 µF 50 V

REPAIR METHOD FOR VST

This publication contains a repair method in the form of a fault-finding tree. This method allows the service technician to locate quickly and efficiently certain troubles in a period that he is not yet familiar with the set.
Generally speaking, the fault-finding tree does not help to isolate a defective part, but it points to the defective circuit.

- For voltage measurements according to this repair method use is made of a universal voltmeter.
  To allow the location of quickly changing voltages (e.g. DATA signals) use is made of a logic probe.
  This probe can be ordered under codenumber 4822 395 30107.
  If this probe is not available it is always possible to use an oscilloscope for this measurement.
- If this repair method states the necessity to measure the DATA signal at pin 24 on 7018 it is recommendable to measure at the same time the CLOCK signal and the DLEN signal at the pins 25 and 23 on 7018 respectively, because these signals are generated simultaneously by the microcomputer.
- If this repair method does not allow to locate a defect, it is recommendable to study the related chapter in the Circuit Description of the VST control system.
- Replacement of the microcomputer 7018 shall only be considered when absolutely necessary. The fact is that the internal programme memory is cleared in case of replacement of the microcomputer.
  Before replacement, always note the channel numbers as they have been preprogrammed in the programme memory.

EXPLANATION OF THE SYMBOLS

For symbols not listed here refer to the Service Manual of the CTO Chassis.

Connect logic probe to pin 24 on 7018 — LP 24-7018

Control of a function on 1100 does not yield the expected result — 1100 ⊗

Search tuning function is operative — ▷▷|

Depress search tuning key — ↓ ▷▷|

LED indicator 6056 lights up — 6056 ⊗

LED indicator on logic probe lights up — LP ⊗

LED indicator on logic probe is blinking — LP ⊗

LED indicator on logic probe does not blink — LP ⊗

Continue fault-finding according to repair methof for Chassis CTO — ⇩ CHASSIS CTO-S

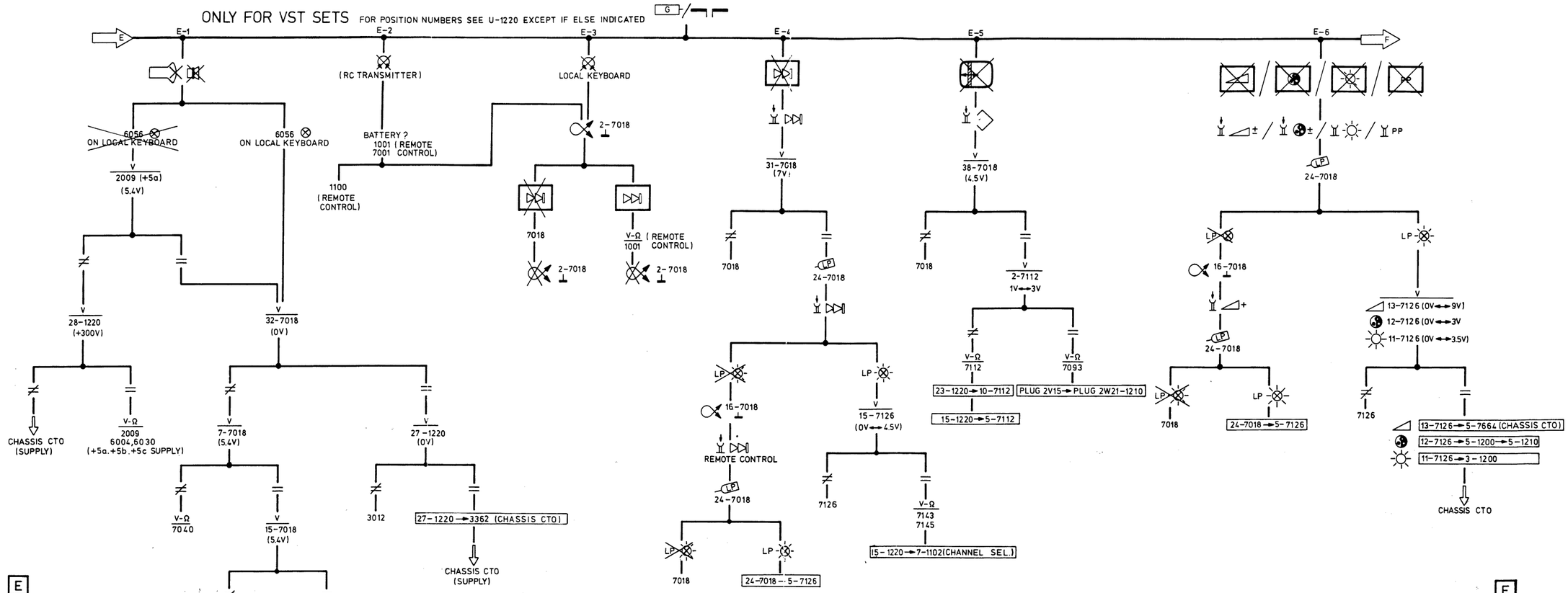
Tuning bar displayed on screen (display on screen) — ◂▸

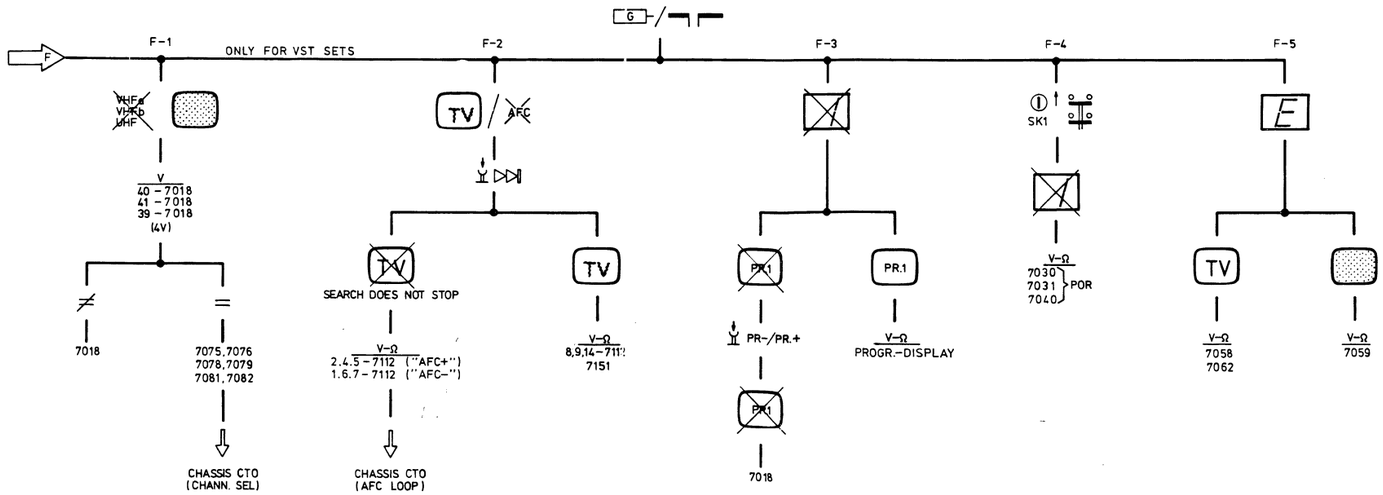
Programme indication — /

Programme 1 is displayed on CRT screen — PR.1

Error, missing supply — E

Distorted picture — TV


ONLY FOR VST SETS
FOR POSITION NUMBERS SEE U-1220 EXCEPT IF ELSE INDICATED
E-1
E-2
E-3
E-4
E-5
E-6
(RC TRANSMITTER)
LOCAL KEYBOARD
6056 ON LOCAL KEYBOARD
6056 ON LOCAL KEYBOARD
2009 (+5a) (5.4V)
BATTERY ? 1001 (REMOTE 7001 CONTROL)
1100 (REMOTE CONTROL)
2-7018
7018
V-Ω 1001 (REMOTE CONTROL)
2-7018
31-7018 (7V)
38-7018 (4.5V)
24-7018
16-7018
REMOTE CONTROL
15-7126 (0V⟷4.5V)
2-7112 1V⟷3V
23-1220→10-7112
PLUG 2V15→PLUG 2W21-1210
15-1220→5-7112
16-7018
24-7018
13-7126 (0V⟷9V)
12-7126 (0V⟷3V
11-7126 (0V⟷3.5V)
7126
13-7126→5-7664 (CHASSIS CTO)
12-7126→5-1200→5-1210
11-7126→3-1200
CHASSIS CTO
28-1220 (+300V)
32-7018 (0V)
CHASSIS CTO (SUPPLY)
2009 6004,6030 (+5a.+5b.+5c SUPPLY)
7-7018 (5.4V)
27-1220 (0V)
7040
15-7018 (5.4V)
3012
27-1220→3362 (CHASSIS CTO)
CHASSIS CTO (SUPPLY)
7053
7018
7143 7145
15-1220→7-1102(CHANNEL SEL.)
24-7018→5-7126
7018
24-7018→5-7126
7018
E
E
33701E2/636


F-1
F-2
F-3
F-4
F-5
ONLY FOR VST SETS
VHF VHF-D UHF
TV / AFC
SK1
E
40-7018 41-7018 39-7018 (4V)
7018
7075,7076 7078,7079 7081,7082
CHASSIS CTO (CHANN. SEL)
SEARCH DOES NOT STOP
2.4.5-7112 ("AFC+") 1.6.7-7112 ("AFC-")
CHASSIS CTO (AFC LOOP)
8,9,14-7112 7151
PR.1
PR-/PR.+
PROGR.-DISPLAY
7018
7030 7031 7040 POR
7058 7062
7059

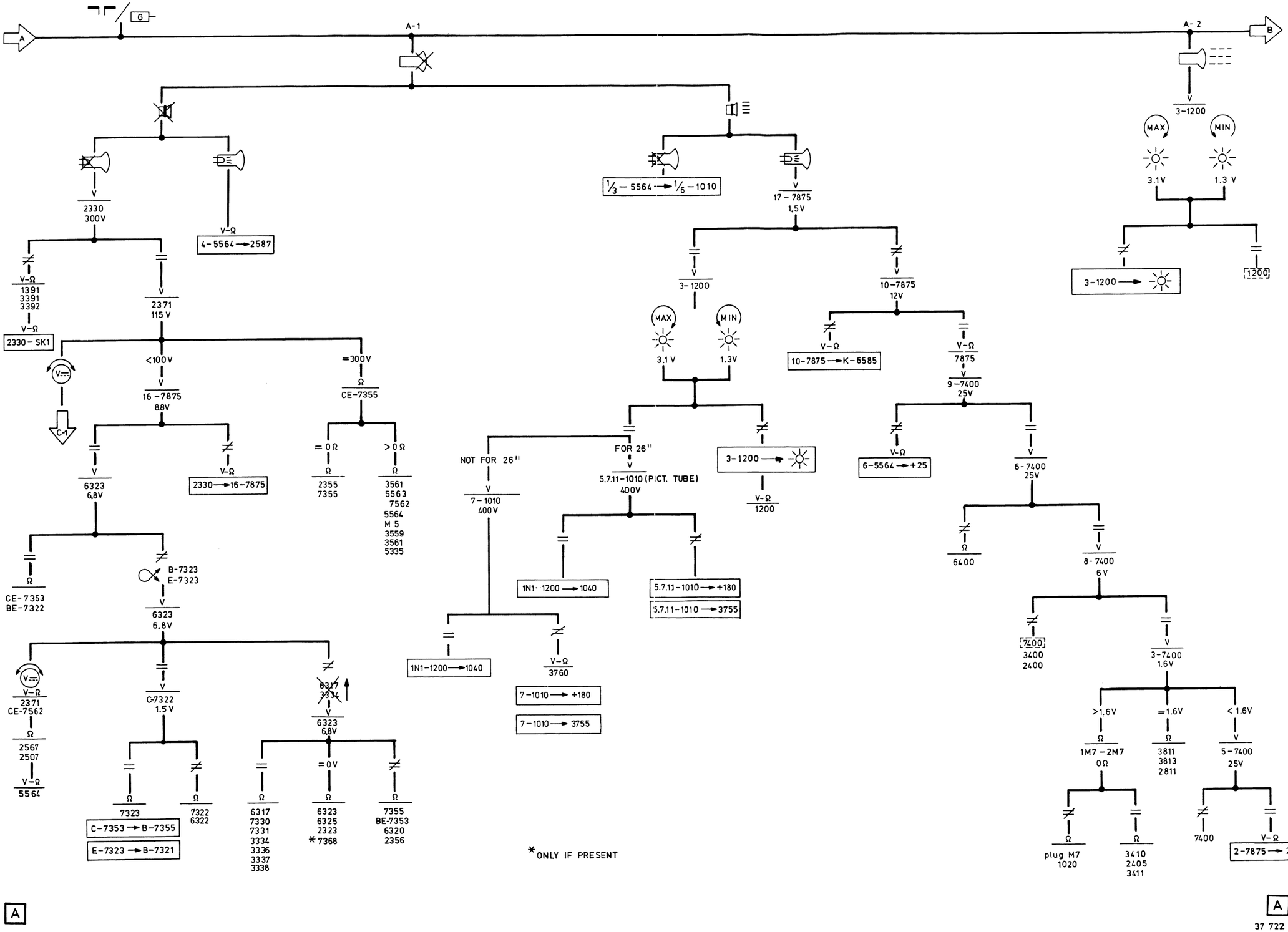
33699D2

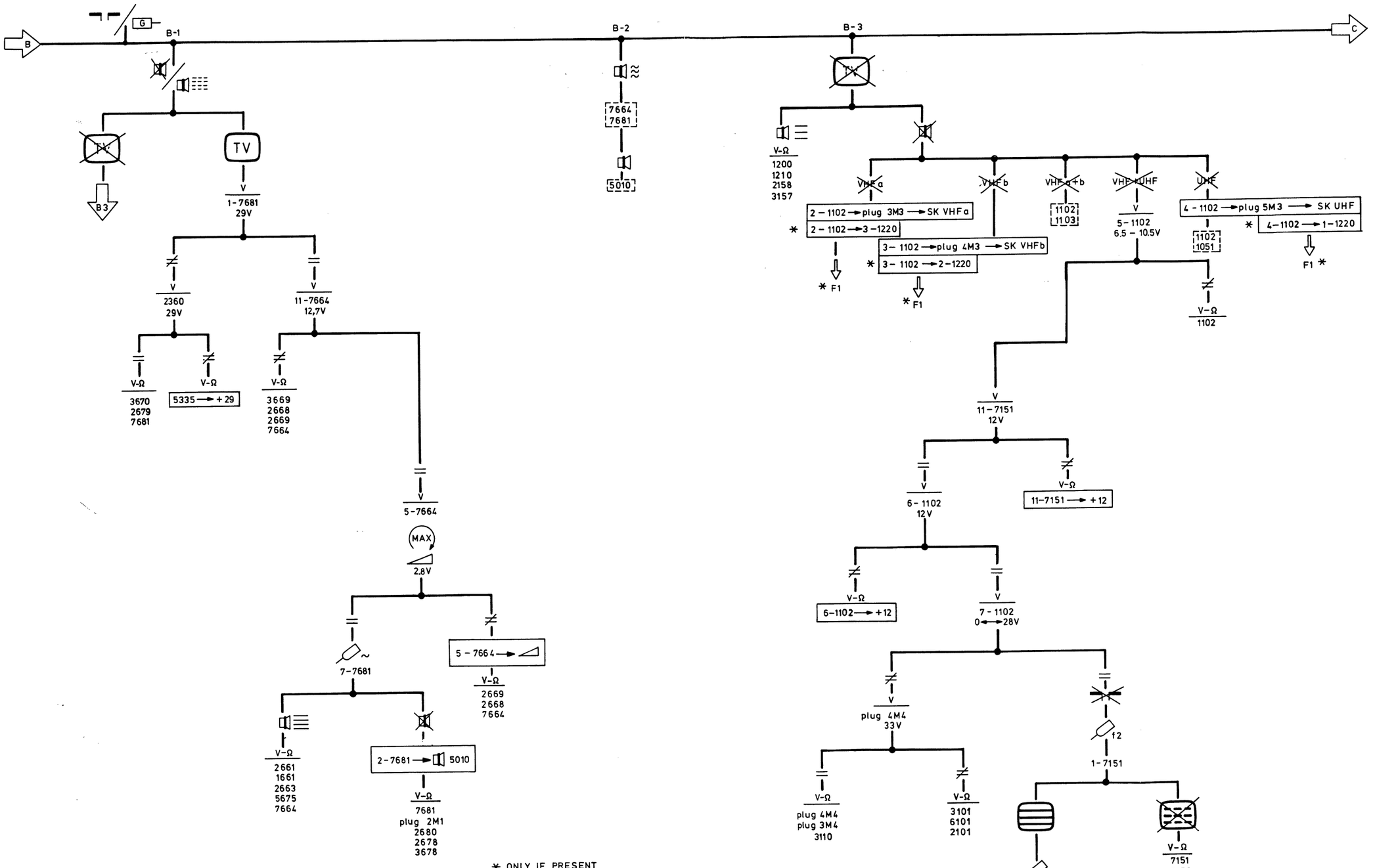
SYMBOLS FOR FAULT-FINDING TREES

A B	Connect the points A and B		Brightness control		No vertical deflection
	Supply aerial signal		Volume control		No vertical synchronisation
	Remove aerial signal		Saturnation control		No horizontal synchronisation
G	Connect generator		Adjustment (general)	TV	Horizontal centring incorrect
V	Carry out voltage measurements		Adjustment yields no result	TV	Vertical centring incorrect
Ω	Carry out resistance (Ohmic) measurements		Filament of picture tube glows		Vertical linearity incorrect
V-Ω	Check circuit of ... and ...		Filament of picture tube does not glow	TV	The left and right vertical lines are curved
=	Correct		Normal light	TV	Horizontal and vertical amplitude incorrect
≠	Incorrect		No light		Heavy horizontal bars
<	Lower than		Little light		Colour blurrs in black/white picture
>	Higher than		Normal sound		Strong colour noise in black/white picture
	Check circuit between ... and ...		Weak sound	R B G	Incorrect sequence of colours (no colour sync.)
MAX	Set control to maximum		No sound		Line frame (Venetian blinds)
MIN	Set control to minimum		Sound distorted		Weak horizontal bars
0 ⟷ 28 V	Voltage adjustable by tuning	TV	Correct black/white picture		One or two colours weak or not present
U	Remove unit	TV	No or weak picture		Weak colours
U	Replace unit		Picture discoloured uniformly		No colours
V	Supply voltage "hiccups"	TV	Vertical amplitude too small or too large		Loudspeaker
	Inject	TV	Horizontal amplitude too small or too large		Continue in other fault-finding tree

INDEX FAULT FINDING TREE

Fault	see	Fault	see
No light	A-1	Vertical linearity incorrect	C-8
Insufficient light	A-2	Horizontal amplitude incorrect	C-9
No or weak sound	B-1	Horizontal centring incorrect	C-10
Sound distorted	B-2	Vertical centring incorrect	D-1
No or weak picture	B-3	Horizontal and vertical amplitude incorrect	D-2
Supply voltage "hiccups"	C-1	No colours	D-3
No horizontal synchronisation	C-2	One or two colours weak or not present	D-4
No synchronisation	C-3	Picture discoloured uniformly	D-5
No vertical synchronisation	C-4	No colour sync.	D-6
No vertical deflection	C-5	Line frame (venetian blinds)	D-7
Vertical amplitude incorrect	C-6	Colour noise in black/white picture	D-8
The left and right vert. lines are curved (East-West-fault)	C-7	Colour blurrs in black/white picture	D-9


A
G
A-1
A-2
B
V 2330 300V
V-Ω 4-5564→2587
V-Ω 1391 3391 3392
V-Ω 2330-SK1
V 2371 115V
V-Ω 2371 CE-7562
Ω 2567 2507
V-Ω 5564
C-1
<100V
V 16-7875 8.8V
V 6323 6.8V
V-Ω 2330→16-7875
Ω CE-7353 BE-7322
B-7323 E-7323
V 6323 6.8V
V-Ω 2371 CE-7562
V C-7322 1.5V
Ω 7323
Ω 7322 6322
C-7353→B-7355
E-7323→B-7321
6317 3334
V 6323 6.8V
Ω 6317 7330 7331 3334 3336 3337 3338
=0V
Ω 6323 6325 2323 *7368
>0Ω
Ω 3561 5563 7562 5564 M5 3559 3561 5335
=300V
Ω CE-7355
= 0Ω
Ω 2355 7355
>0Ω
Ω 7355 BE-7353 6320 2356
1/3-5564→1/6-1010
V 17-7875 1.5V
V 3-1200
MAX
3.1V
MIN
1.3V
NOT FOR 26"
V 7-1010 400V
1N1-1200→1040
V-Ω 3760
7-1010→+180
7-1010→3755
FOR 26"
V 5.7.11-1010 (PICT. TUBE) 400V
1N1-1200→1040
5.7.11-1010→+180
5.7.11-1010→3755
3-1200→
V-Ω 1200
V 10-7875 12V
V-Ω 10-7875→K-6585
V-Ω 7875
V 9-7400 25V
V-Ω 6-5564→+25
Ω 6400
V 6-7400 25V
V 8-7400 6V
7400 3400 2400
V 3-7400 1.6V
>1.6V
Ω 1M7-2M7 0Ω
plug M7 1020
Ω 3410 2405 3411
=1.6V
Ω 3811 3813 2811
<1.6V
V 5-7400 25V
7400
V-Ω 2-7875→2M7
V 3-1200
MAX
3.1V
MIN
1.3V
3-1200→
1200
*ONLY IF PRESENT

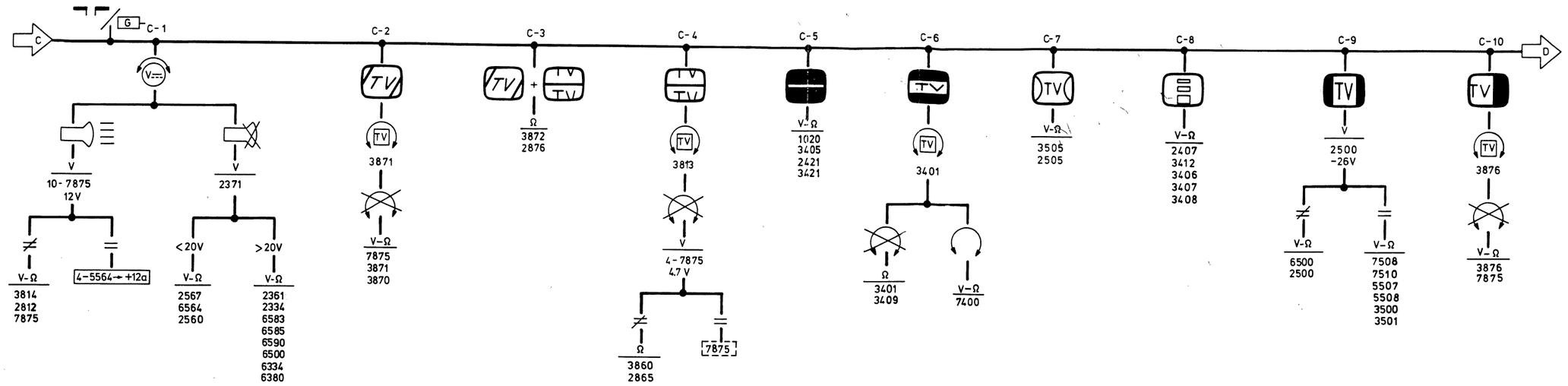


B

B

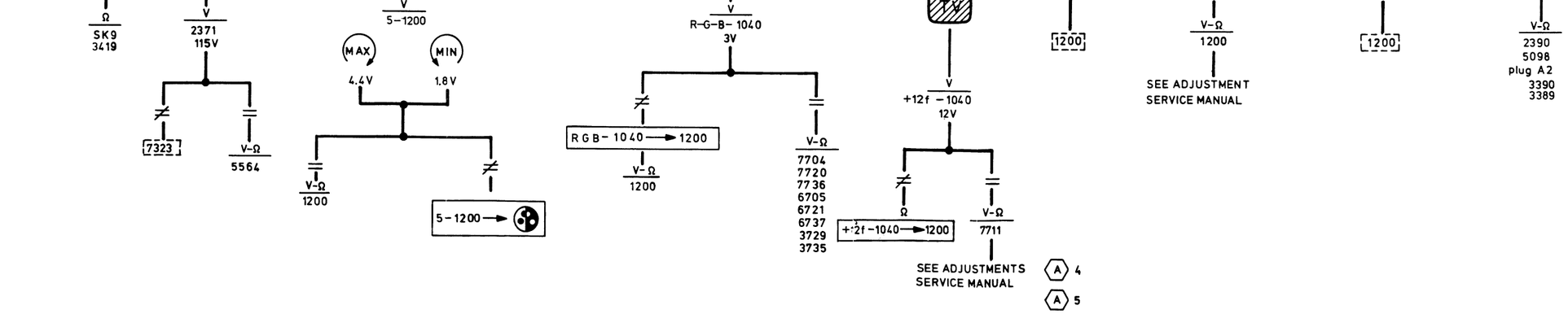
33702D2 / 639

CS 6 424



C

33700D2/637



D

37 723 D12/639

1150 TXT-DECODER

TELETEXT DATA ACQUISITION AND CONTROL

S/P CONVERTOR

USERS COMMAND DECODER + STORAGE

WRITE CONTROL CIRCUIT

S/P CONVERTOR

DATA CHECK + COMPARATOR

DATA SELECTOR

BIT COUNTER

ROW ADDRESS LATCH

—TELETEXT PAGE MEMORY—

ADDRESS DECODER + MEMORY 2048×8BITS

DATA I/O CONTROL

TXT POWER SUPPLY

1230

VIDEO INPUT PROCESSOR

DATA SLICER

TIMING CHAIN

ROW ADDRESS LATCH

TIMING PULSE GENERATOR

DIV :10

DIV :6

DIV :64

DIV :625

COMP. SYNC GENERATOR

CHARACTER GENERATOR

CONTROL CHARACTER DEDECTION AND STORAGE

ROM

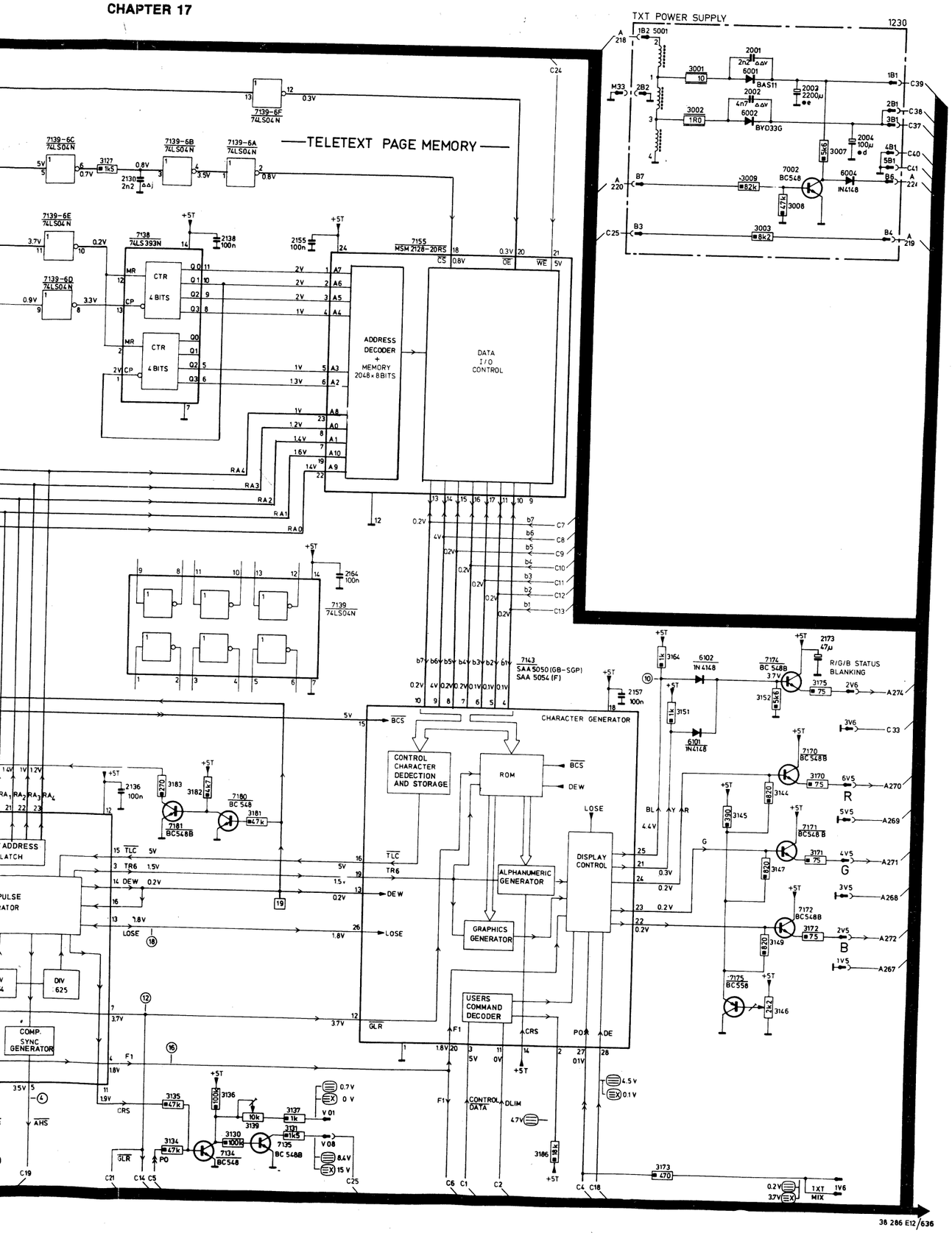
ALPHANUMERIC GENERATOR

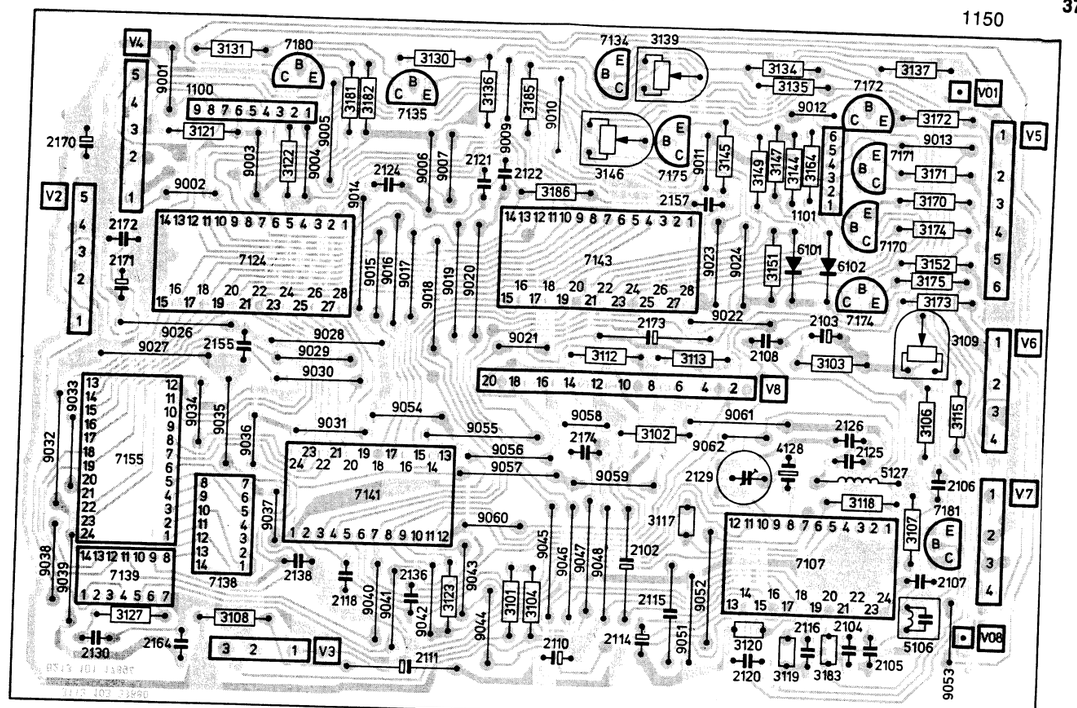
GRAPHICS GENERATOR

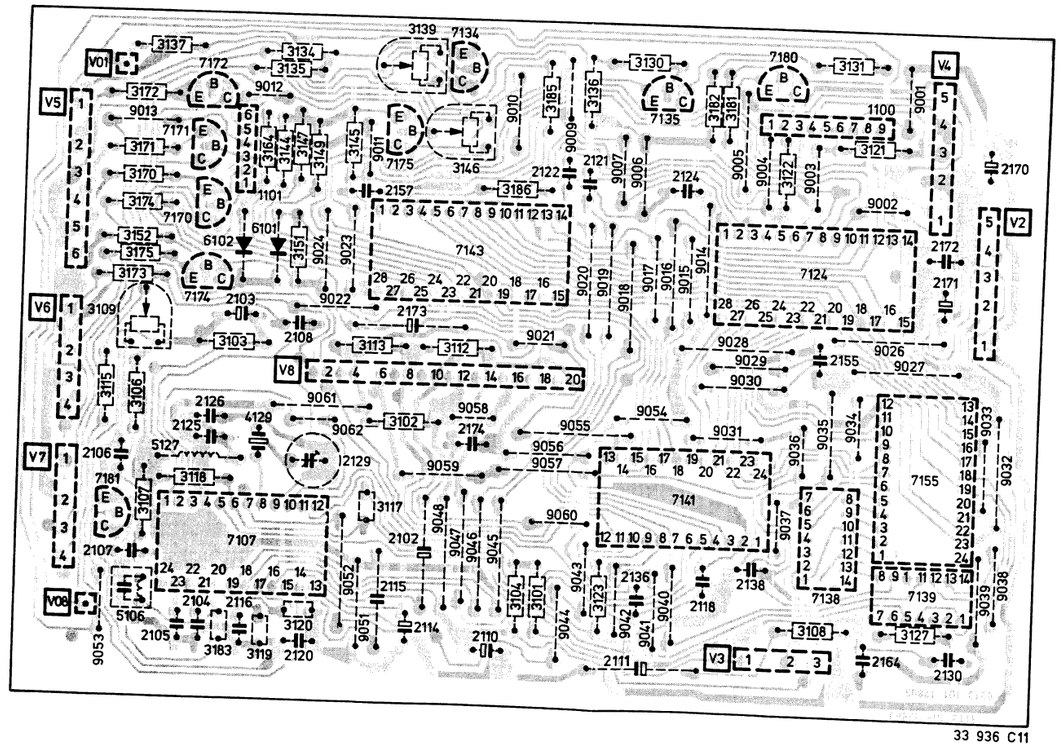
DISPLAY CONTROL

USERS COMMAND DECODER

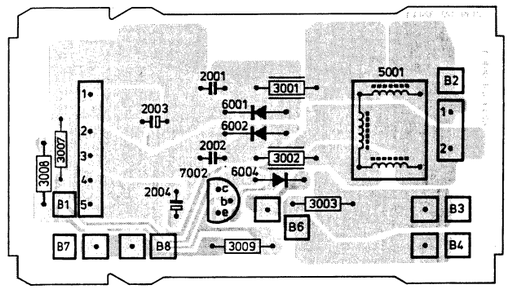
R/G/B STATUS BLANKING


TELETEXT PAGE MEMORY
TXT POWER SUPPLY
1230
ADDRESS DECODER + MEMORY 2048 x 8BITS
DATA I/O CONTROL
CHARACTER GENERATOR
CONTROL CHARACTER DEDECTION AND STORAGE
ROM
ALPHANUMERIC GENERATOR
GRAPHICS GENERATOR
DISPLAY CONTROL
USERS COMMAND DECODER
SAA 5050 (GB-SGP) SAA 5054 (F)
R/G/B STATUS BLANKING
ADDRESS LATCH
PULSE GENERATOR
DIV 625
COMP. SYNC GENERATOR
38 286 E12/636

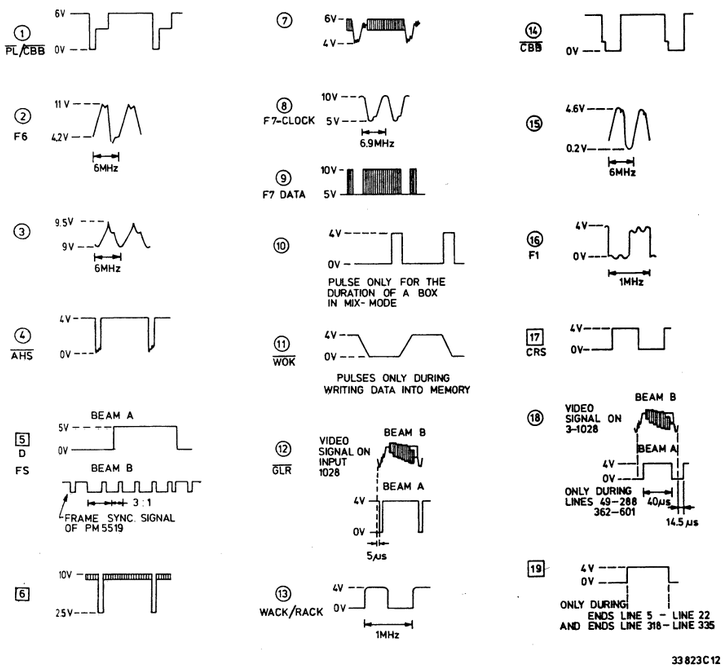

1150
33 935 C11/64O


33 936 C11

TXT-SUPPLY



38 347 A12


① PL/CBB 6V 0V
② F6 11V 4,2V 6MHz
③ 9,5V 9V 6MHz
④ AHS 4V 0V
⑤ D FS BEAM A 5V 0V BEAM B 3:1 FRAME SYNC. SIGNAL OF PM 5519
⑥ 10V 2,5V
⑦ 6V 4V
⑧ F7-CLOCK 10V 5V 6,9MHz
⑨ F7 DATA 10V 5V
⑩ 4V 0V PULSE ONLY FOR THE DURATION OF A BOX IN MIX-MODE
⑪ WOK 4V 0V PULSES ONLY DURING WRITING DATA INTO MEMORY
⑫ GLR VIDEO SIGNAL ON INPUT 1028 BEAM B BEAM A 4V 0V 5µs
⑬ WACK/RACK 4V 0V 1MHz
⑭ CBB 0V
⑮ 4,6V 0,2V 6MHz
⑯ F1 4V 0V 1MHz
⑰ CRS 4V 0V
⑱ VIDEO SIGNAL ON 3-1028 BEAM B BEAM A 4V 0V ONLY DURING LINES 49–288 362–601 40µs 14,5µs
⑲ 4V 0V ONLY DURING ENDS LINE 5 – LINE 22 AND ENDS LINE 318 – LINE 335
33823C12

ADJUSTMENTS OF THE TELETEXT DECODER (SISED)

1. Frame synchronisation of the timing chain

Apply to the set a signal of the PM5515. Connect one channel to a double beam oscilloscope with delayed time base to the video output of the generator and make the frame synchronisation signal visible (see Fig. 1).
Connect the other channel to point 13 of 7107.
Adjust 3109 until the leading edge of the pulse on point 13 of 7107 appears on the position as shown in Fig. 1.

2. 6 MHz oscillator

Short-circuit 2103. Connect a resistor of 5.6 MΩ between point 7 of 7107 and the +13c.
Switch the set into MIX mode. Connect an aerial signal with teletext information. Look at the teletext display.
Adjust 2129 until the teletext display is stationary.
Remove the resistor and the short-circuit.

3. Clock circuitry

- Connect an aerial signal.
- Tune the receiver to a transmitter with a teletext signal, while the teletext pageheader shows the time with minutes and seconds.
- If possible, attenuate the aerial signal.
- Switch the set into position "Teletext" and observe the display of the time upon adjusting.
  Mostly the last characters in the pageheader show the time.
- Turn the core of the clock coil 5106 on the teletext decoder, until the first wrong character appears.
- Note down this position of the core.
- Turn the core of the clock coil into the opposite direction, until the first wrong character appears again.
- Note down this position of the core too.
- Turn the core into the middle position between both positions noted down.

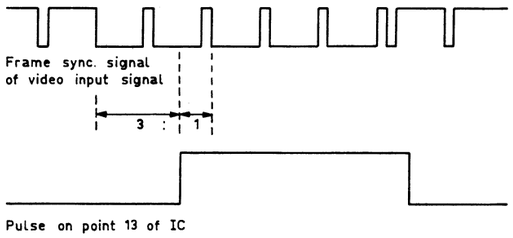


Fig. 1

4. Note

The DC voltages have been measured with erased memory.
The memory can be erased as follows:
- Depress a programme button that holds no programme.
- Set the receiver to the teletext mode and depress the STOP button.
- Depress a programme button holding a programme with teletext information.

LOCATING ADDRESSING ERRORS

1. Loosen one side of jumper "R" near the chrominance 7150 on the small signal panel.
   Connect a piece of wire with measuring pin to point 9 of 7150.
2. Inject an aerial signal containing teletext information.
   Turn the set on and select the teletext mode.
   The receiver screen will display the normal TV picture with a slightly decreased contrast. Therefore increase the contrast with the contrast control.
3. When transferring the test probe successively to the points indicated in Fig. 2, a defined pattern will be displayed on the screen.
   The patterns are also shown in Fig. 2.
   In the pictures of this figure a TV picture is represented by a white portion and a teletext picture by a black portion.
   In order to be able to count easier the number of bars indicated it is recommendable to choose a teletext page, the contents of which do not modify again and again.

REPAIR METHOD

This documentation contains a repair method in the form of a fault-finding tree, enabling the technician - in a period that he is not yet familiar with the circuit - to locate faults quickly and efficiently. He should have an aerial signal with teletext and a multipurpose meter at his disposal.
Generally speaking, the fault-finding tree does not point to the defective part, but to the defective circuit.

Remark:
With this repair method it is assumed that the +5 and +12 supply voltages are present on the teletext decoder.

ELUCIDATION OF THE FAULT-FINDING TREE OF THE TELETEXT DECODER

1. A teletext page comprises 24 rows. The first row is labelled RØ and the last row R23.
2. Each row is divided into 5 blocks of 8 characters each (Pos. 1÷8).
   Example: 1RØ means: block 1 (= first 8 characters) of row 0.
3. "x" means: the character at this location is irrelevant.
4. "Mixed": the television picture and the teletext information (correct or wrong) are simultaneously displayed on the screen.
5. "Normal": brightness and contrast set to normal position.
6. "≈": display seems OK, but the characters are not always correct.
7. "P...": chosen pagenumber; normally in 1RØ.
8. EXOR: note character code (b7÷b1) of the wrong character and the desired character from the character set. EXOR the 2 binary codes and determine the wrong bit.

   Example: the screen display : sgg"rcgg
   this should read : see page

	b7	b6	b5	b4	b3	b2	b1
character code for wrong character g:	1	1	0	0	1	1	1
character code for correct character e:	1	1	0	0	1	0	1
EXOR	0	0	0	0	0	1	0
						=	

   Thus bit b2 is faulty.
9. For an explanation on the used symbols and abbreviations in the fault-finding tree see the last pages of this publication.

1 39 24-
2 7
3 27- 22-
4 19 11- 1-
5 98 1-

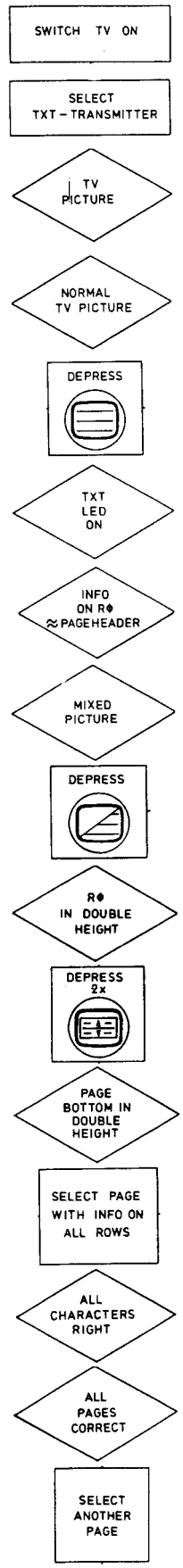
MSM2128
N74LS04
N74LS393
SAA5020
SAA5030
SAA5042
SAA5050
SAA5054

BC548B
BC548
BC558
IN4148

4128

5106
5127

EXPLANATION OF SYMBOLS



Switch TV on

Select transmitter with teletext information

TV picture present

TV picture is displayed with normal brightness and contrast

Depress teletext button

Teletext LED illuminated

Info present on row 0 which (seemingly) resembles info in page header

TV picture and teletext info simultaneously present

Select other transmitter with TXT-information

Row 0 is displayed in double height

Depress twice Top/Bottom button

Lower half of page display in double height

Select teletext page containing info on all rows

All characters are correct

Alle pages are correct

Select another teletext page

Info is only displayed in block 5 of row 0

Voltage on point 15 of TAC-IC = ≈ 5 V

Voltage on point 8 of memory IC = 0 V

F_V pulses are present on point 28 of TROM-IC

Short horizontal stripes are visible on the screen

Synchronisation of the TV picture is correct

Synchronisation of the character display is correct

Only P100 present in block 1 of row 0

Info present in block 5 of row 0

40 vertical white stripes are visible

F1 pulses on point 20 of TROM-IC are correct

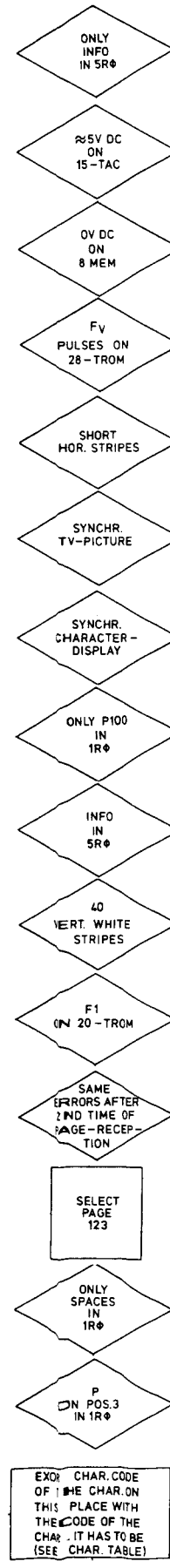
Same errors are displayed after 2nd time of page reception

Select teletext page 123

Spaces present only in bloc 1 of row 0

Character P present on pos. 3 in block 1 of row 0

EXOR character code of the character on this place against character code of desired character (see character table)


ONLY INFO IN 5R0
≈5V DC ON 15-TAC
0V DC ON 8 MEM
FV PULSES ON 28-TROM
SHORT HOR. STRIPES
SYNCHR. TV-PICTURE
SYNCHR. CHARACTER-DISPLAY
ONLY P100 IN 1R0
INFO IN 5R0
40 VERT. WHITE STRIPES
F1 ON 20-TROM
SAME ERRORS AFTER 2ND TIME OF PAGE-RECEPTION
SELECT PAGE 123
ONLY SPACES IN 1R0
P ON POS.3 IN 1R0
EXOR CHAR.CODE OF THE CHAR.ON THIS PLACE WITH THE CODE OF THE CHAR. IT HAS TO BE (SEE CHAR. TABLE)

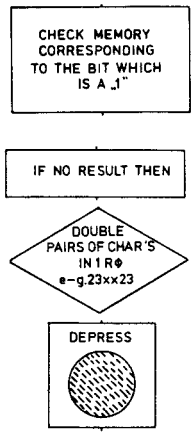
10

Check memory corresponding to the bit which is a "1"

If no result then...

Double pairs of characters present in block 1 of row 0 e.g. 23xx23

Depress button for normal TV picture

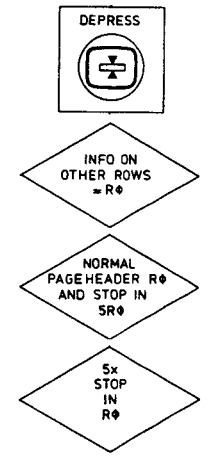


Depress stop button

Info on other rows is identical with info on row 0

Page header is normal and STOP is present in block 5 of row 0

5x STOP present on row 0



After Hours Sync	$\overline{\text{AHS}}$
	Antenna signal
	Ask client once again what's wrong
Memory address-line	A1, A2, etc.
Big Character Select	$\overline{\text{BCS}}$
Colour Burst Blanking	$\overline{\text{CBB}}$
Character Rounding Select	$\overline{\text{CRS}}$
Chip Select	$\overline{\text{CS}}$
Display Enable	DE
Data Entry Window	DEW
Data Limiter	DLIM
15625 Hz pulses	F_H pulses
Fast Line Reset	FLR
Frame Sync	FS
50 Hz pulses	F_V pulses
1 MHz clock	F1
6 MHz clock	F6
6,9375 MHz clock or data	F7
General Line Reset	$\overline{\text{GLR}}$
	HF-IF part of chassis
LOAD Output Shiftregister	LOSE
Enable	
Memory	$\overline{\text{MEM}}$
Phase Lock	$\overline{\text{PL}}$
Picture On	PO
Read Address Clock	RACK
Row Address 0...4	$\overline{\text{RA0...4}}$
Users Command Data	$\overline{\text{RC-DATA}}$
Read/Write	R/$\overline{\text{W}}$
7124	TAC
Teletext Data	
ACQUISITION & CONTROL	
Top/Bottom	$\overline{\text{T}}$/b
7141 Timing Chain	$\overline{\text{TIC}}$
Transmitted Large Character	$\overline{\text{TLC}}$
6 MHz clock	TR6
	Transmission
Teletext	Txt
7143 Character Generator	TROM
7107 Video Input Processor	VIP
Write O.K.	WOK
Write Address Clock	$\overline{\text{WACK}}$
Write Enable	$\overline{\text{WE}}$

ADJUSTMENTS OF THE TELETEXT DECODER (SISED)

1. Frame synchronisation of the timing chain

Apply to the set a signal of the PM5515. Connect one channel to a double beam oscilloscope with delayed time base to the video output of the generator and make the frame synchronisation signal visible (see Fig. 1).
Connect the other channel to point 13 of 7107.
Adjust 3109 until the leading edge of the pulse on point 13 of 7107 appears on the position as shown in Fig. 1.

2. 6 MHz oscillator

Short-circuit 2103. Connect a resistor of 5.6 MΩ between point 7 of 7107 and the +13c.
Switch the set into MIX mode. Connect an aerial signal with teletext information. Look at the teletext display.
Adjust 2129 until the teletext display is stationary.
Remove the resistor and the short-circuit.

3. Clock circuitry

- Connect an aerial signal.
- Tune the receiver to a transmitter with a teletext signal, while the teletext pageheader shows the time with minutes and seconds.
- If possible, attenuate the aerial signal.
- Switch the set into position "Teletext" and observe the display of the time upon adjusting.
  Mostly the last characters in the pageheader show the time.
- Turn the core of the clock coil 5106 on the teletext decoder, until the first wrong character appears.
- Note down this position of the core.
- Turn the core of the clock coil into the opposite direction, until the first wrong character appears again.
- Note down this position of the core too.
- Turn the core into the middle position between both positions noted down.

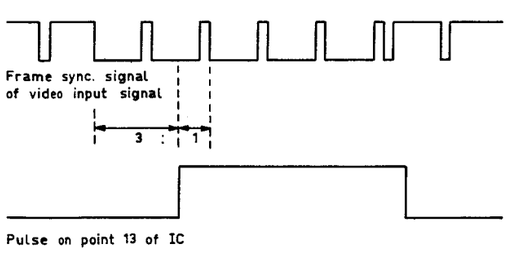


Fig. 1

4. Note

The DC voltages have been measured with erased memory.
The memory can be erased as follows:
- Depress a programme button that holds no programme.
- Set the receiver to the teletext mode and depress the STOP button.
- Depress a programme button holding a programme with teletext information.

LOCATING ADDRESSING ERRORS

1. Loosen one side of jumper "R" near the chrominance 7150 on the small signal panel.
   Connect a piece of wire with measuring pin to point 9 of 7150.
2. Inject an aerial signal containing teletext information.
   Turn the set on and select the teletext mode.
   The receiver screen will display the normal TV picture with a slightly decreased contrast. Therefore increase the contrast with the contrast control.
3. When transferring the test probe successively to the points indicated in Fig. 2, a defined pattern will be displayed on the screen.
   The patterns are also shown in Fig. 2.
   In the pictures of this figure a TV picture is represented by a white portion and a teletext picture by a black portion.
   In order to be able to count easier the number of bars indicated it is recommendable to choose a teletext page, the contents of which do not modify again and again.

REPAIR METHOD

This documentation contains a repair method in the form of a fault-finding tree, enabling the technician - in a period that he is not yet familiar with the circuit - to locate faults quickly and efficiently. He should have an aerial signal with teletext and a multipurpose meter at his disposal.
Generally speaking, the fault-finding tree does not point to the defective part, but to the defective circuit.

Remark:
With this repair method it is assumed that the +5 and +12 supply voltages are present on the teletext decoder.

ELUCIDATION OF THE FAULT-FINDING TREE OF THE TELETEXT DECODER

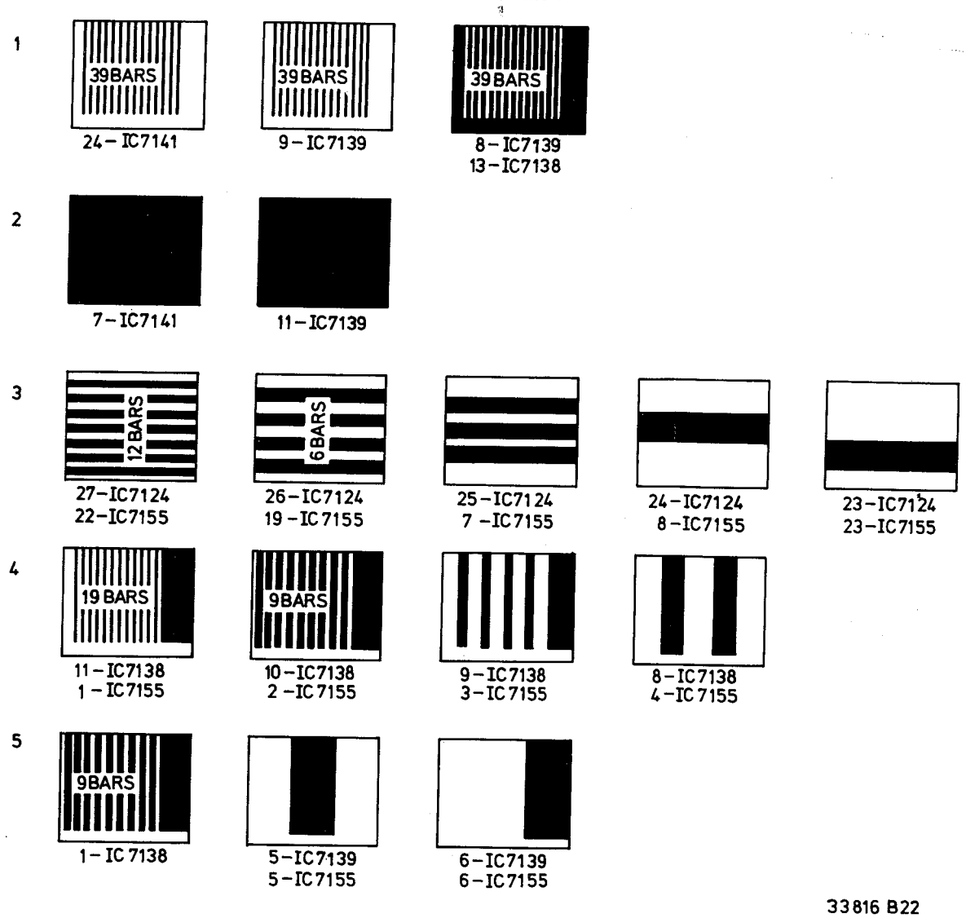
1. A teletext page comprises 24 rows. The first row is labelled RØ and the last row R23.
2. Each row is divided into 5 blocks of 8 characters each (Pos. 1÷8).
   Example: 1RØ means: block 1 (= first 8 characters) of row 0.
3. "x" means: the character at this location is irrelevant.
4. "Mixed": the television picture and the teletext information (correct or wrong) are simultaneously displayed on the screen.
5. "Normal": brightness and contrast set to normal position.
6. "≈": display seems OK, but the characters are not always correct.
7. "P...": chosen pagenumber; normally in 1RØ.
8. EXOR: note character code (b7÷b1) of the wrong character and the desired character from the character set. EXOR the 2 binary codes and determine the wrong bit.

   Example: the screen display : sgg"rcgg
   this should read : see page

	b7	b6	b5	b4	b3	b2	b1
character code for wrong character g:	1	1	0	0	1	1	1
character code for correct character e:	1	1	0	0	1	0	1
EXOR	0	0	0	0	0	1 =	0

   Thus bit b2 is faulty.

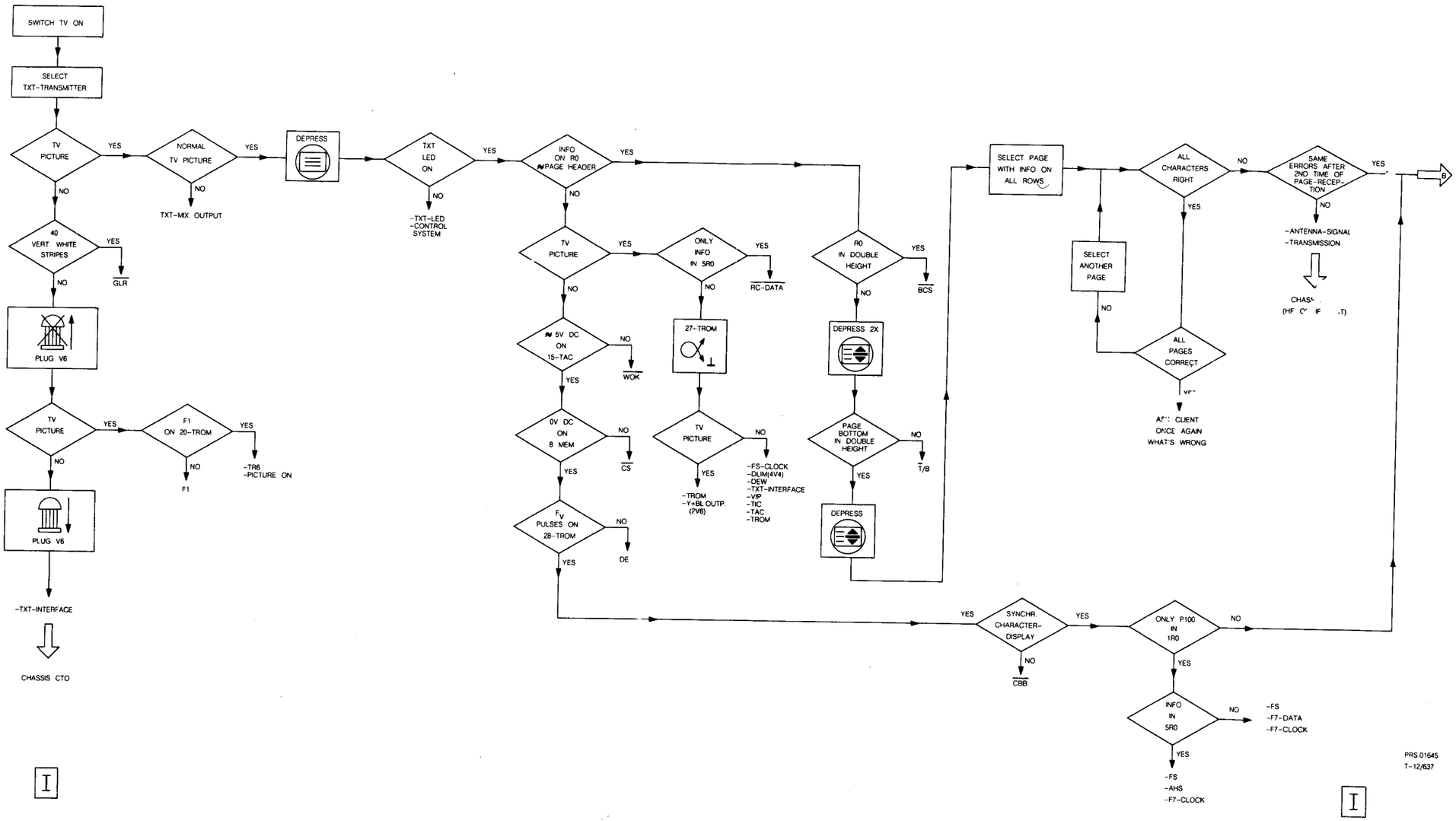
9. For an explanation on the used symbols and abbreviations in the fault-finding tree see the last pages of this publication.

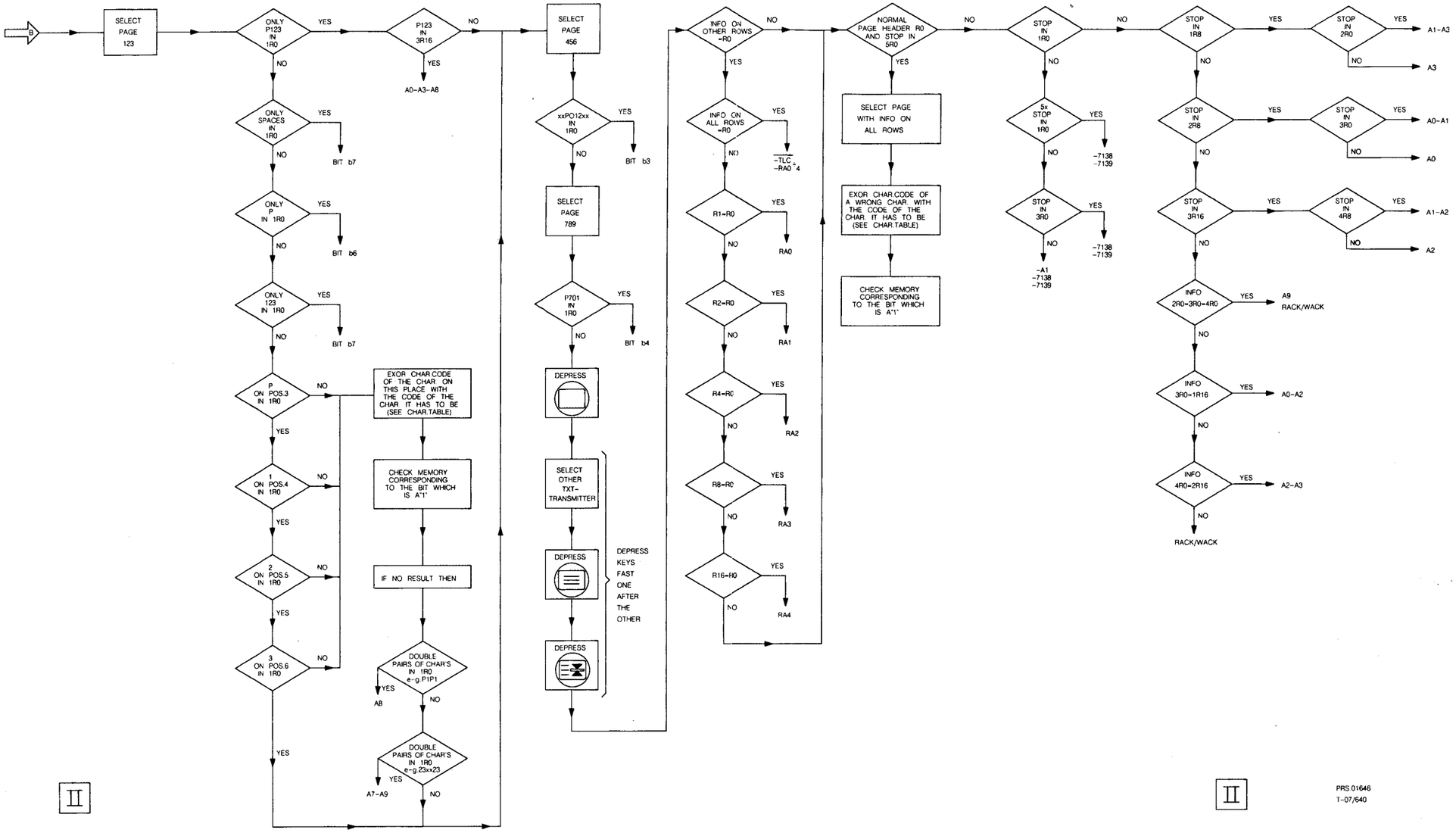


33816 B22

MSM2128-20RS	4822 209 10379	
N74LS04N	4822 209 80783	
N74LS393N	4822 209 80447	
SAA5020	4822 209 10047	
SAA5030	4822 209 10048	
SAA5042	4822 209 10052	
SAA5050	4822 209 10046	
SAA5054	4822 209 83057	
BC548B	4822 130 40937	
BC548	4822 130 40938	
BC558	4822 130 40941	
IN4148	4822 130 30621	
4128	4822 242 70392	6 MHz
5106	4822 154 90038	9,4 µH
5127	4822 157 51815	10 µH

2103	4822 124 40435	10 µF 50 V
2115	5322 121 54049	3.3 nF 63 V
2129	4822 125 50017	5.5 - 65 pF
3146	4822 100 10029	2 kΩ potm.
3109	4822 100 10035	10 kΩ potm.
3139	4822 100 10035	10 kΩ potm.
1101	4822 212 21305	VMU unit
1100	4822 212 21306	Tacet unit
V8	4822 265 40147	20p


SWITCH TV ON
SELECT TXT-TRANSMITTER
TV PICTURE
YES
NO
NORMAL TV PICTURE
YES
NO
TXT-MIX OUTPUT
DEPRESS
TXT LED ON
YES
NO
-TXT-LED -CONTROL SYSTEM
INFO ON R0 ≈PAGE HEADER
YES
NO
40 VERT WHITE STRIPES
YES
NO
GLR
PLUG V6
TV PICTURE
YES
NO
F1 ON 20-TROM
YES
NO
F1
-TR6 -PICTURE ON
PLUG V6
-TXT-INTERFACE
CHASSIS CTO
I
TV PICTURE
YES
NO
ONLY INFO IN 5R0
YES
NO
RC-DATA
≈ 5V DC ON 15-TAC
NO
WOK
YES
0V DC ON 8 MEM
NO
CS
YES
F_V PULSES ON 28-TROM
NO
DE
YES
27-TROM
TV PICTURE
YES
NO
-TROM -Y+BL OUTP. (2V6)
-FS-CLOCK -DLIM(4V4) -DEW -TXT-INTERFACE -VIP -TIC -TAC -TROM
R0 IN DOUBLE HEIGHT
YES
NO
BCS
DEPRESS 2X
PAGE BOTTOM IN DOUBLE HEIGHT
NO
T/B
YES
DEPRESS
SELECT PAGE WITH INFO ON ALL ROWS
ALL CHARACTERS RIGHT
NO
YES
SELECT ANOTHER PAGE
NO
ALL PAGES CORRECT
YES
SAME ERRORS AFTER 2ND TIME OF PAGE-RECEP-TION
YES
NO
-ANTENNA-SIGNAL -TRANSMISSION
CHASS
(HF C IF T)
B
YES
SYNCHR. CHARACTER-DISPLAY
YES
NO
CBB
ONLY P100 IN 1R0
NO
YES
INFO IN 5R0
NO
-FS -F7-DATA -F7-CLOCK
YES
-FS -AHS -F7-CLOCK
PRS 01645
T-12/637
I

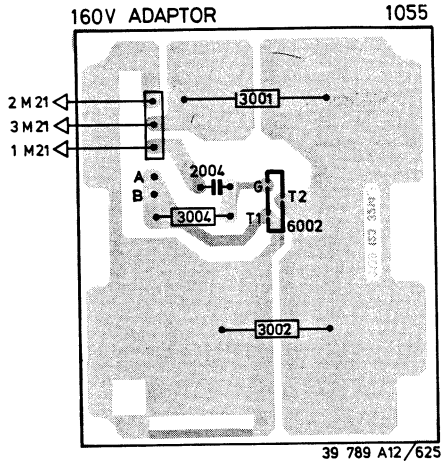


II

II

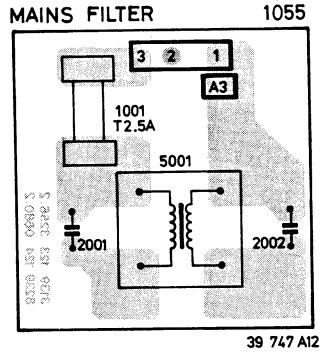
PRS 01646
T-07/640

160V ADAPTOR 1055



39 789 A12/625

MAINS FILTER 1045 1055



39 747 A12